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BIRD-BANDING

A JOURNAL OF ORNITHOLOGICAL INVESTIGATION

Vol. II OCTOBER, 1931 No. 4

SOME DETAILS OF THE MIGRATION HABITS OF WHITE-THROATED SPARROWS

By MABEL GILLESPIE

GLENOLDEN, eight miles southwest of the Philadelphia City Hall, is two miles from the Delaware River, and just on the edge of the fall line of tributary streams.[1] The river valley south of Philadelphia, with its sheltered location and mild temperature in winter, is a favorite winter resort for a number of species of insectivorous birds. White-throated Sparrows are always found here in winter in varying numbers, though they are more rare and local winter residents north of Philadelphia except in similarly favored regions such as the lower Connecticut Valley. Mr. R. J. Middleton, of Norristown, Pennsylvania, sixteen and two-thirds miles northwest of Glenolden, traps large numbers of White-throats during fall migrations, but he neither traps nor (with one exception to be noted below) sees any during the winter.

For the past five years practically all trapping in Glenolden has been done within a few hundred feet of our house, and for the most part within fifty feet. Directly back of our property a neglected plot, formerly devoted to orchard and truck farming, is choked with weeds whose seeds tempt many birds. The ground beyond this plot gives way precipitously to the winding woodland ravine which follows the course of a small stream. In this ravine there is shelter from the high winds of winter, and along the valley the wintering flocks of birds which visit our feeding and banding station range for at least a quarter of a mile below the station and for probably a half a mile at least above. White-throats banded near the house have been seen frequenting the woods on the farther slope at least a quarter of a mile beyond the ravine. We have hoped in time to be able to assemble data on the distance such winter flocks wander from day to day, since our experience seems at

[1] A map of the Glenolden region was shown in *Bird-Banding*, Vol. I, No. 3, July, 1930.

variance with the experience of others, who report that wintering birds do not range more than a few hundred feet from a banding station. This fact is mentioned in spite of the lack of detailed proof because of the bearing it has on a point mentioned below.

Our bird-banding activities in Glenolden started in October, 1922. Therefore we have records of White-throated Sparrows (*Zonotrichia albicollis*) from early fall to late spring during nine winter seasons (excepting the early fall of 1922). Trapping is carried on pretty regularly during the winter season. Traps are usually in operation from dawn until eight A.M., frequently during the entire morning, and many times throughout the day. They are usually operating all Saturday and Sunday. Sometimes during a slack period the traps are removed for a while. On the occasional days of snow every effort is made to carry on trapping as extensively as possible. Therefore the records present regular and complete results throughout the season as a whole.

During the winter of 1928–29 it was not possible to devote any time to banding except in the early morning and on Saturdays and Sundays. Yet the results exceeded those of any other year to date. In 1929–30 far more time was devoted to banding than during any previous year, but only a few White-throats were taken during the entire winter. Therefore it seems that even intermittent banding would fairly represent the winter population, and if any individuals were missed, it would be those passing through and stopping for only short intervals.

We are convinced that practically every White-throat that stays for any length of time in the ravine within a distance of a quarter of a mile at least from our banding station, is trapped and banded. We base this conclusion on the fact that in winter we practically never see unbanded White-throats in the field. We do trap new birds in January, February, and March, but conclude that they are new arrivals at the time of banding. (This point will be discussed later.) Therefore, if a White-throat is not trapped during an interval of six weeks or more when others are continually being trapped, we feel certain that in most cases the individual has left the locality entirely or has met with disaster.

As already mentioned, there is a great quantity of weed seeds available, and the bait of the traps lures the wintering birds only at times. The White-throats are usually found with a winter flock composed of several species which ranges up and down the ravine, perhaps not visiting the trapping

station for days at a time, though individuals may come now and then. A spell of frost, snow, or a decided change in weather brings the assorted birds of this flock quickly to the feeding and banding station, though high wind, even when accompanied by cold weather, keeps birds closely within the shelter of the ravine. At times of extreme weather, newcomers often appear and join the flock, or members of the flock may disappear. The charts show days now and then, or periods of two or three days, when nearly if not all the resident birds show up as if in answer to a roll-call.

As far as our files are concerned, the White-throat records are merely a bulky mass of nearly seven hundred cards, containing detailed information as to plumages, and in some cases tracing plumage-changes and molts in detail. The migration data are there, of course, but are entirely obscured. When these data are assembled and tabulated, one suddenly begins to note the fact that movements appear to be made by groups, and that the migration details vary from season to season for masses, groups, and even for individuals.

FALL MIGRATION

During the second, third, and fourth years of our trapping, we had a series of traps placed over an area of about two acres in the bottomland and on one side of the ravine. Eventually we were obliged to confine trapping almost entirely to stations within sight of the house, both because of vandalism and because of the amount of time and energy required to make hourly visits to the traps. This change apparently affected only the migrants as far as numbers are concerned. The number of wintering birds taken was probably no less in any season, though their repeats might be fewer. During the succeeding years the number of birds taken during times of migration was noticeably smaller. Meanwhile trees and shrubbery have grown appreciably on our property, the orchard that originally lay between us and the woodland has "gone wild," and on the only other property that lay between us and the woods the house was destroyed by fire and the grounds have since been uncared for. Thus the wilderness has come to us slowly, with the result that in the fall of 1930 the number of migrating White-throats caught at home approached the former quantities caught over a much larger area.

It should be noted that, although the records of wintering birds do not suffer seriously if two or three days elapse now and then when no banding is done and if the station territory is restricted; banding during a migration rush to be truly

representative must be pursued continuously and over a considerable area. Mr. Middleton, of Norristown, has records of migrating White-throats that are far more adequate than ours, because his trapping suffers no interruptions, and because he has a series of substations over a territory of several acres.

In considering the data of fall migration, therefore, some of Mr. Middleton's records have been included by way of comparison. Chart No. 1 shows the available data by years at Glenolden. A detached vertical line in the space following the date of a year indicates the day on which the first sight record of a White-throat for the season occurred. These sight records start in 1921, two years before the banding station was established. A horizontal line in the space following a year date indicates the duration of trapping for the fall season. Small vertical lines affixed to these duration lines indicate migration peaks or waves. In 1925, 1927, and the following years, a second space for each year marked "M" shows the duration of the fall banding period for White-throats at Mr. Middleton's station with migration peaks indicated, but does not include the first sight records.

It is interesting to note that prior to the fall of 1928, Mr. Middleton had but one trap in operation, and that he trapped but 81 White-throats in the fall of 1925, his first year, none in the fall of 1926, and 54 in the fall of 1927, as compared with several hundred handled in each succeeding fall. As to the failure to trap in the fall of 1926, Mr. Middleton writes: "From my migration records I find that White-throats were common all through October and present in fair numbers until the middle of November (in 1926). During the summer of 1926 we built a chicken-house with a good-sized run right close to the place where I had my one trap located, and although the trap was fenced in, the chickens could get fairly close to it. I did not move the trap farther back in the woods until most of the birds had passed, and I think this accounts for not taking any. It was not because of their scarcity, as my records show about a normal movement that fall."

It must be remembered that at Norristown fall migration of White-throats definitely ends, and (with one exception) no more White-throats are seen until spring, while at Glenolden there is merely a cessation of the migration rush, and new individuals appear now and then throughout the winter. All birds trapped in Glenolden after the final fall-migration date as given on the chart, are included in the series of winter-residence charts.

In considering the data on fall migration, we first notice

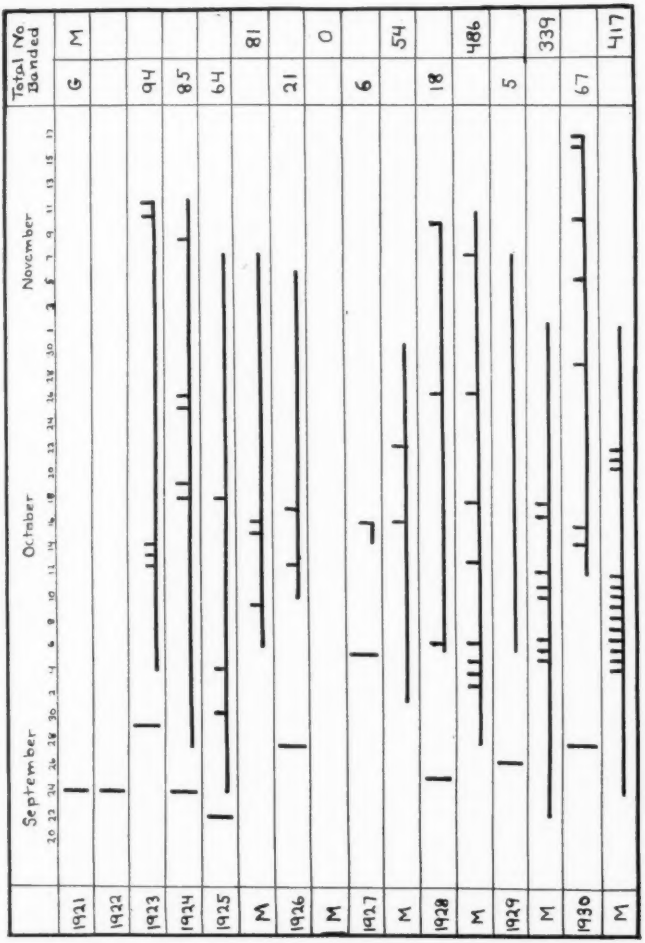


Chart 1. Fall Migration.

Detached vertical lines indicate date of first sight record at Glenolden for each year. Horizontal lines indicate duration of fall migration trapping; those directly following year dates are at Glenolden, those in space below year date marked M are at Norristown. Small vertical lines rising from the horizontal lines indicate migration peaks as shown by trapping results. Total numbers banded during the period of fall migrations are given in columns at right. G = Gillespie, M = Middleton.

that there seems to be a fairly constant lapse between the date on which the first sight record is made and the date when trapping begins. In 1923, 1924, and 1925 there is a lapse of but two to four days. In those three years trapping was done over a large area, as before stated. In the five following years there is a lapse of from ten to twelve days between the day when the first sight record was made and the day on which the first bird was trapped. This is what might be expected at the more restricted detached banding station.

When we compare the dates of duration of fall migration in Glenolden and Norristown, we note that the first birds are taken at Norristown ten to fifteen days earlier than the first birds at Glenolden. (This is not true for the fall of 1925, but the fact that Mr. Middleton was just starting his banding operations is sufficient explanation of this exception.) While we would expect the birds to reach the more northern point first, and while we realize that in Glenolden a few days of possible trapping are lost because of the restricted area of trapping, nevertheless it is evident that the flocks are moving very slowly, probably indicating that the migration speed slackens more and more as the flocks approach the territory of winter residence. In 1929 and 1930 Mr. Middleton was trapping White-throats several days before the first straggler was seen in the Glenolden region.

Further comparison of the records indicates that there is no particular relation between the migration peaks of the two stations, though definite conclusions of this sort must be based on careful data for many more years than are here included. However, the lack of correlation between migration peaks in the two localities indicates that the general migration is not a regular movement of so many miles each twenty-four hours with definite stop-overs. The route in this region may be definite and unchanged (and further proof of this will be offered) but the places and durations of stop-overs vary. A migration peak at Norristown one day is no indication that Glenolden will see one that same day, or a given number of days later, though such may frequently be the case.

It is also evident that there is no ratio agreement between the number of White-throats banded in Norristown and the number banded in Glenolden in any given year. This fact lends further weight to the tentative conclusion that though a definite route is followed, the places and durations of stop-overs vary.

There is, of course, no indication whatever that Norristown

lies on the same migration route as Glenolden. Geographically it might seem that such would be the case, since Norristown lies on the Schuylkill River, which flows into the Delaware a few miles north of Glenolden. Although north-and-south river valleys indicate the possibility of concentrated migration-routes, and although greater numbers of birds in general seem to be found in river valleys, nevertheless there is other evidence indicating overland routes. Mr. Middleton has never taken a bird of any species banded by us, nor have we ever taken one of his. Also the river-valley route south from Norristown is rather circuitous. But these considerations need not stand in the way of comparing results between the two stations, since large migration movements are known to occur over many miles of territory simultaneously.

A study of adequate data such as Mr. Middleton's, with due consideration of all the details of atmospheric conditions, should yield illuminating results as to the effect of weather on migration, though I suspect that it might be necessary to know more about the origin and destination of the flocks, and about the exact course of the migration-route all along the line, so that the consecutive and cumulative effects of the weather might be taken into consideration. It is easier to interpret winter movements as influenced by weather conditions with a knowledge of local weather only.

We can, however, in the case of the dates of the first sight records at Glenolden, show conclusively the effect of the weather. In 1921, 1922, and 1924, September 24th was the date of the first sight record; in 1926, September 27th; in 1928, September 25th; and in 1929, September 26th. These dates may be considered about normal, and it happened that the weather in late September was normal in those years. In 1923, the first sight date was September 29th, and we note that the preceding days were unusually warm. In 1925 the first date was September 22d, occurring during a noticeably cold snap. In 1927, late September was very warm, and on October 1st the mercury stood at ninety degrees. Cool weather came on October 4th, and the first White-throats were seen on October 5th. In 1930, late September was warm and humid, and the first White-throats were seen on September 28th.

A further example of the effect of atmospheric conditions on migration is shown by Mr. Middleton's records for the fall of 1928. Never, in any other year, has he trapped or observed White-throats later than November. Occasionally there were one or two stray individuals taken after the regular migration

period noted on the chart. In 1927, one White-throat was taken on November 14th, and one on the 21st, though the migration period had apparently ended on October 30th. But in 1928 White-throats were taken in numbers up to November 11th. One was taken on the 13th, one on the 14th, two on the 16th, one on the 19th, one on the 20th, one on the 21st, one on December 12th, and one on December 13th. Furthermore, two White-throats remained through December, one of which was first banded on November 10th, and the other first banded on October 28th. Mr. Middleton considered this a unique occurrence. The late fall and early winter of 1928 were, however, very mild.

MIGRATING RETURNS

A return,[2] as used in this paper, is a bird taken at or in the near vicinity of the original banding station after a period of migration. Since White-throats are taken at Glenolden during migration periods and during their period of winter residence, there is a possibility of taking *two kinds of returns:* migrating returns and winter-resident returns. Furthermore, the migrating returns may be and have been taken while going south in the fall and again on the northward journey in the spring, or either in the fall, or in the spring of successive years.

Recoveries are defined as banded birds retaken away from the vicinity of the original banding station. No White-throats banded at Glenolden have ever been recovered elsewhere.

The term Migrating Returns is therefore applied to those White-throats taken during one migration season and not retaken for a period of about three months. Since the winter residents, as will be shown in further detail, repeat at intervals during their season of residence, it seems quite certain that these migrating returns were taken both on their way south in the fall, and then on their way north in the spring, and have wintered farther south in the intervening interval. One or two such occurrences might be regarded as exceptional instances of wintering individuals that simply did not repeat during the season of residence, but there are too many records of this kind to permit such an improbable explanation. Furthermore, wintering birds inevitably repeat at times of storm and severe weather. Undoubtedly there are more migrating returns than are included in Chart No. 2, but no birds have been so designated unless an interval of more than three months has elapsed between the fall and spring captures.

[2]See *Bird-Banding*, Vol. I, No. 1, Jan., 1930 "Suggestions for a Revised Bird-Banding Terminology."

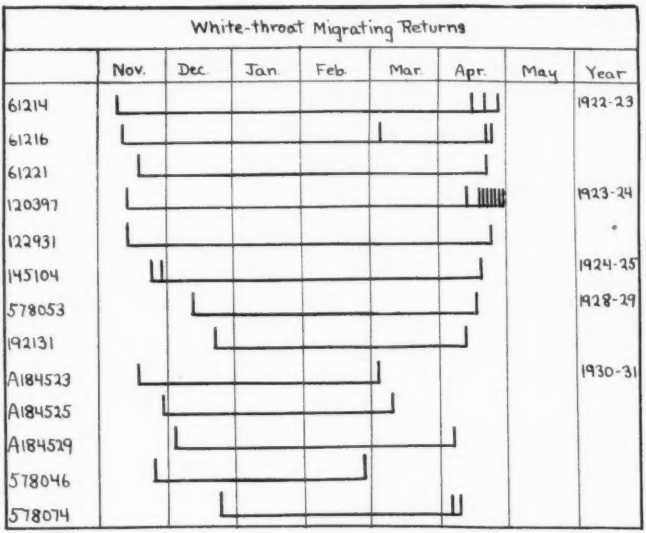


Chart 2. Migrating Returns.

Vertical lines in the space following a band number indicate the times the bird wearing the band with that number was trapped. Small horizontal cross bars on the vertical lines indicate second or third trappings on a given day.

In several cases an individual that has spent one entire winter season at Glenolden, repeating often, will be taken only during migration times in a succeeding year. Examples are numbers 192959 and 578074. Still oftener it is the case that an individual repeats several times during one winter season and is taken only in the fall or only in the spring of a succeeding season, and some individuals have even skipped a year entirely. This indicates, as will be shown later, varying habits for different seasons; but the point to be observed here is that it is all the more clearly demonstrated that we have migrating returns because of these individuals that have been traced through one season by trapping, and then are trapped only at the migration time another year. If such birds were

present throughout the entire winter, they would surely be trapped as they were in past seasons.

Mr. William I. Lyon, of Waukegan, Illinois, has trapped thousands of White-throated Sparrows during migration-times, and has never, so far as the writer has been able to ascertain, had any returns as above defined; and other bird-banders, including Mr. Middleton, with an occasional exception, have failed to get returns from this species when taken during migrations.[1]

It seems that the chances of taking such migrating returns in many localities must be exceedingly slight. On the other hand, from a comparatively small number of White-throats trapped at Glenolden, an appreciable number of migrating returns have been taken. Mr. F. C. Lincoln (unpublished correspondence) says, "The indication is that these birds [White-throats] return to their winter quarters of former years, but that they either follow a different migration-route, or that they make different migration stops while *en route* between summer and winter quarters." A consideration of the records here presented indicates that the latter alternative is the more probable, and that in any case there are undoubtedly banded migrating White-throats passing by stations that are never retaken.

As already suggested, when birds stay but a short time in a territory of several acres, they may or may not visit the vicinity of the traps, and likewise they may or may not be caught even if near the traps. The fact that as many migrating returns as are listed have been taken at Glenolden is a great argument in favor of the probability of a very definite migration-route followed both in fall and in spring, at least through the lower Delaware Valley. (Further arguments to this end will be forthcoming). If the migration-route is definitely followed, the stop-over for Glenolden may be but for a night, or may even be omitted and made elsewhere, depending on weather conditions, etc.

It seems also as if the data, or lack of it, concerning migrating returns, might indicate a certain habit of migration. We have already noticed that the first date of trapping White-throats in the fall is from one to two weeks later in Glenolden than in Norristown, which is but sixteen and two-thirds miles northwest. As the flocks come nearer to the general area of

[1] Mr. Middleton has had one return and one recovery from a grand total of 1483 White-throats: A115136, banded Oct. 26, 1928, returned Oct. 10, 1929, and A100232, banded Oct. 8, 1928, recovered April 29, 1930, Manchester, N. H.

winter residence, it seems that they move more and more slowly. This would entail longer stop-overs, with more chances of trapping migrating returns. Such a theory would offer an explanation of the fact that at Glenolden, which is just within the usual northern limits of the area of winter residence, we have succeeded in taking migrating returns, while other operators farther north, who have banded far greater numbers of White-throats during migrations, have failed to take returns.

That some White-throats do linger for some time during migration periods is shown both by Mr. Middleton's records and by ours. A good number of fall migrants repeat, though these repeats, for the most part, are included within a week's time or less, a period that indicates the average duration of the migration halt. But there are a smaller number of White-throats that linger from two weeks to a month, which may be referred to as leisurely migrants.

Striking examples are the individuals lingering late into December at Mr. Middleton's station in 1928. At Glenolden we find individuals not only remaining for some time in the fall, but appearing early in the spring and then lingering a while, and also individuals that are appearing and disappearing throughout the winter. These leisurely migrants may be considered better after we have dealt with the features of the period of winter residence.

PERIOD OF WINTER RESIDENCE

In the light of the preceding paragraph it appears that it would be inaccurate to refer to all birds taken during the

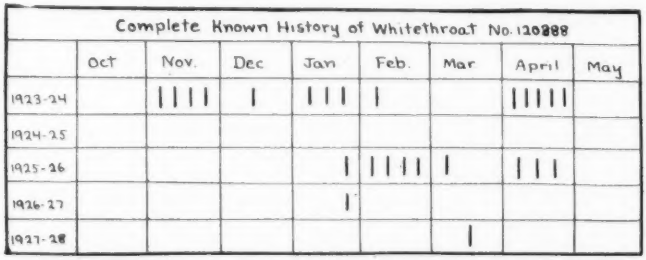


Chart 3. Complete Known History of White-throat No. 120388. Vertical lines indicate times of trapping.

interval between the migration periods of fall and spring as winter residents. Some of them do spend the entire winter season in Glenolden, and others apparently come and go. Therefore we must refer to all birds trapped between migration periods as those taken during the period of winter residence.

We are apt to think of the winter territory of birds as possessing a definiteness similar to that of nesting territory; and, indeed, such observations as have been made by Mr. S. Prentiss Baldwin and his associates at Thomasville, Georgia, and by bird-banders in other regions, indicate that such is frequently the case.[2]

That definiteness of territory does not prevail among the White-throats at Glenolden is indicated by the records of returns, where it is shown that the history of any individual is apt to vary radically from year to year. No. 120388, for instance, spent the entire winter at Glenolden from November through April the first year, never appeared the next year, was taken in January, February, and March the third year, was taken twice in January the fourth year, and but once in March the fifth year. An interesting detail of this bird's history is the fact that in March of the fifth year, the bird was taken during a late spring snowstorm which had the effect of rounding up a large number of birds that otherwise might never have been taken. Had there been such a snowstorm at the psychological moment during the second year, we should undoubtedly have taken the bird then.

Other returns show similar variety in winter history. Therefore it seems that an important point to be noted in studying White-throat migrations at Glenolden is the definiteness of the migration-route, whereas the actual halting-points or the duration of the stop-over may vary. This theory is also upheld by records already considered.

Mr. Middleton's experience, however, has been similar to that of Mr. Baldwin and Mr. Musselman. As before mentioned, he has never trapped White-throats later than December, and he reports that White-throats do not winter in Norristown as a rule. In 1928–29, already described as a mild winter, there was an exception to this rule. Mr.

[2] "Among the migrants, the White-throated Sparrows make up the most interesting group, and I have long ago decided that this is a definite neighborhood group, coming here each winter, since I first found them in 1915, always at Station A."—S. P. Baldwin, "Adventures in Bird Banding in 1921," *The Auk*, Vol. XXXIX, No. 2, April, 1922, p. 216.

"I believe that Mr. Baldwin's conclusions that the White-throats at Thomasville are very local in distribution and in their activities are fully warranted. In fact nearly all of the birds captured at this banding station showed a tendency to feed chiefly in one locality."—T. E. Musselman, "Bird Banding at Thomasville, Ga., 1923," *The Auk*, Vol. XL, No. 3, July 1923, p. 448.

Middleton writes: "In reference to the White-throats wintering during 1928–29, there were five to ten here all winter and they were settled in a weed-and-briar patch about one hundred feet from my nearest group of traps. Three of these birds repeated during December, and one of these was killed by a rat while in a sparrow-trap on December 30th. After this happened they came near the traps at times but did not enter. There were plenty of weed seeds where they were located, and that may have had something to do with their not entering the traps. However, one of those that was taken during December did repeat on April 15th in the same group of traps near the spot where they were all winter."

This incident adds to the data upholding the theory of varying winter histories, since the members of this group did not winter at Norristown during other winters. However, it is additional proof of the tendency of White-throats to settle for the winter in small groups within a very limited area, and, as already stated, the groups of White-throats are not thus confined in Glenolden. Perhaps the extent of winter-areas during a period of residence is conditioned by the lay of the land.

The accompanying group of charts, numbers 4–12, shows the local White-throat population-status for each entire winter season, October to May, with the exception of the casual migrants of fall and spring. Short vertical lines in the space following a band-number indicate each time the bird wearing that band was trapped (repeats and returns), while the connecting horizontal line indicates the duration of the bird's known history. In the case of returning birds, this horizontal line must be followed from chart to chart, or noted on another chart featuring returns only. The letter R at the left-hand end of a horizontal line indicates that the individual returned after having been first banded during a previous season. The letter R at the right-hand end of a horizontal line indicates that the individual returned during a subsequent season. A small horizontal mark on a short vertical line indicates a second trapping for the individual on a given date. In a very general manner local weather conditions have been noted on the charts, initials being used:—C for cold, R for rain, S for snow and W for warm. These weather descriptions are given only when they show a definite connection between the weather and the contemporary trapping, and in no way present a complete picture of the season. However, snowfalls are infrequent during most winters, and snowfalls of any extent invariably affect trapping and are therefore noted.

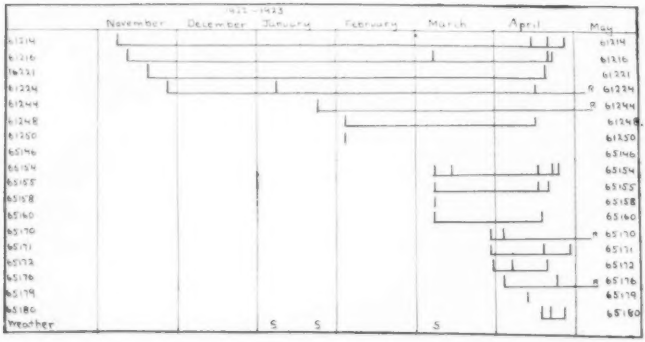


Chart 4. Local White-throat Population Status for 1922–1923.

It has been impossible to go more fully into a study of the effect of weather-conditions on trapping and bird migration, but in general it is safe to say that during any considerable period when the trapping is very slack, the weather has been mild or at least has not been subject to sudden or severe changes. An example of this is shown in February, 1925, when few birds were taken and when the weather was uniformly mild. According to our field notes, banded White-throats were seen throughout the month, although the chart indicates that none was present.

The duration of the winter season includes nearly the entire period when White-throats are to be found in Glenolden, since some winter residents stay from early October until late April or even early May. In order to keep the charts from being obscured by too much detail, it has seemed best to exclude the mass of fall and spring migrants. This has necessitated the arbitrary setting of dates that end the time of fall migration and begin the period of spring migration, though the arbitrariness seems justified when the records themselves suggest such dates. The records thus excluded deal entirely with individuals handled but once, or whose repeats occur within a period of a week or two. There are also individuals that are handled but once, or within a few days' time between the limiting dates of the two large seasonal migrations, but their records are shown on the charts. In many cases, birds first appearing in the height of the migration rush have stayed throughout the winter, while the majority of birds taken at about the same

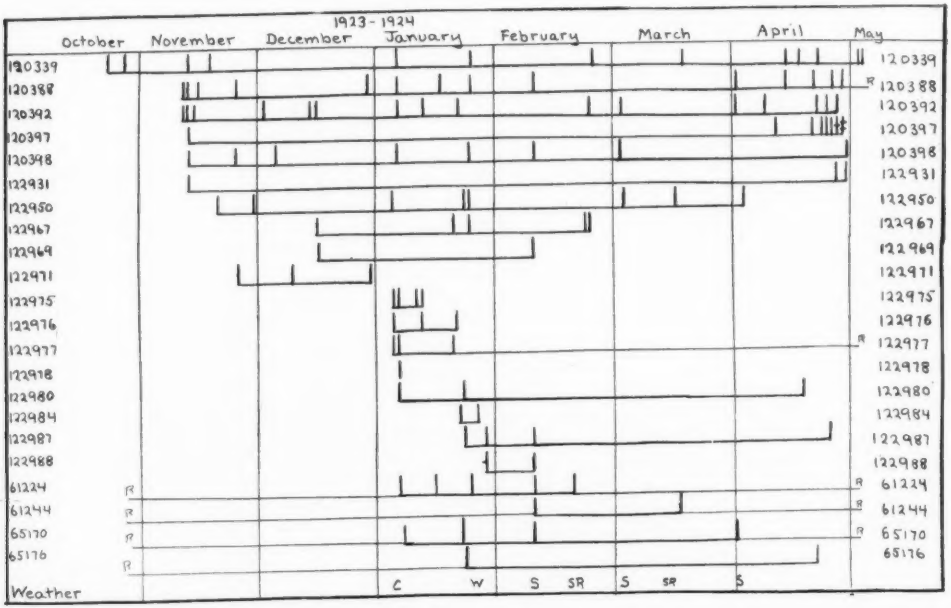


Chart 5. 1923–1924.

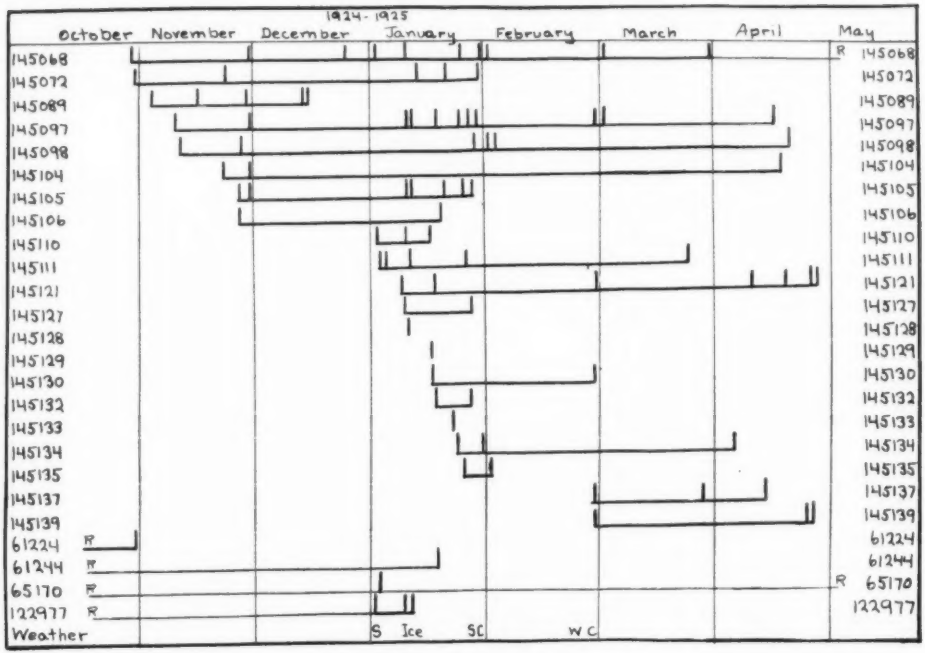


Chart 6. 1924–1925.

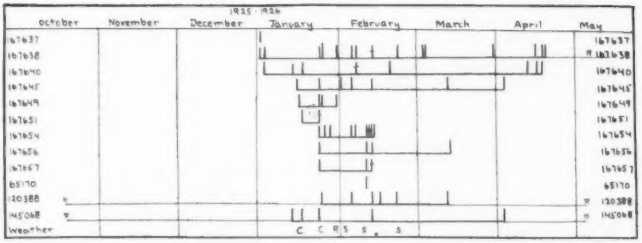


Chart 7. 1925–1926.

time have soon passed on. In order to clarify this complication, the inclusive dates for fall and spring migrations have been indicated on the Fall and Spring Migration Charts (Nos. 1 and 14). Of all the birds trapped before the final date allowed for the fall-migration period, or after the first date of the stated spring-migration period, only those repeating through the winter or subsequently returning are included on the Winter Season Charts.

In studying these charts, the indication of small group movements is striking. In many cases three, four, or more birds appear for the first time within a few days of one another, sometimes all on the same day. They frequently repeat together subsequently during the season, and then simultaneously terminate their histories for the season. There are, for example, 192065, –66, –67, –68 and 167638, apparently late

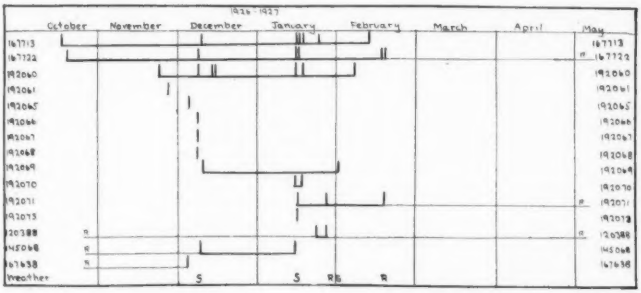


Chart 8. 1926–1927.

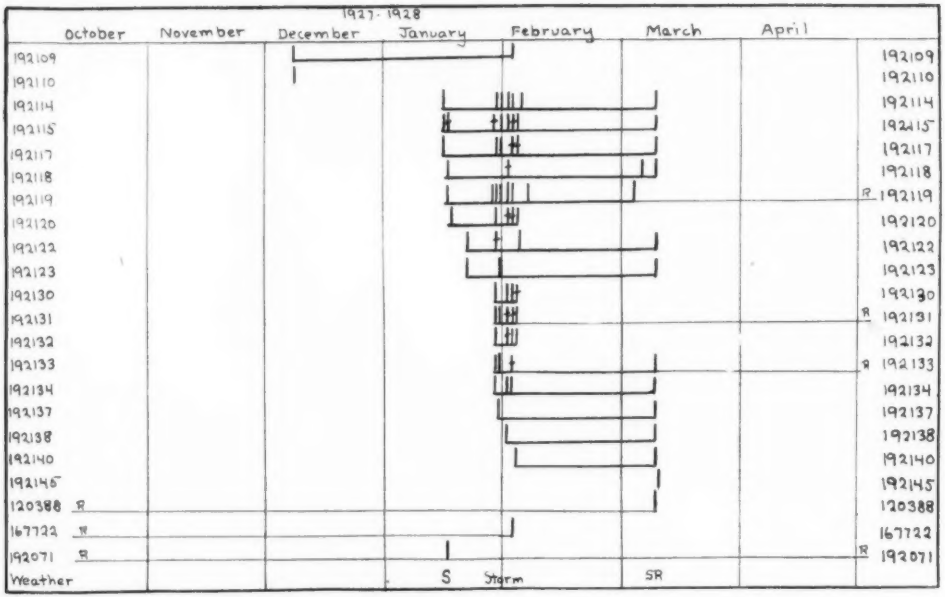


Chart 9. 1927–1928.

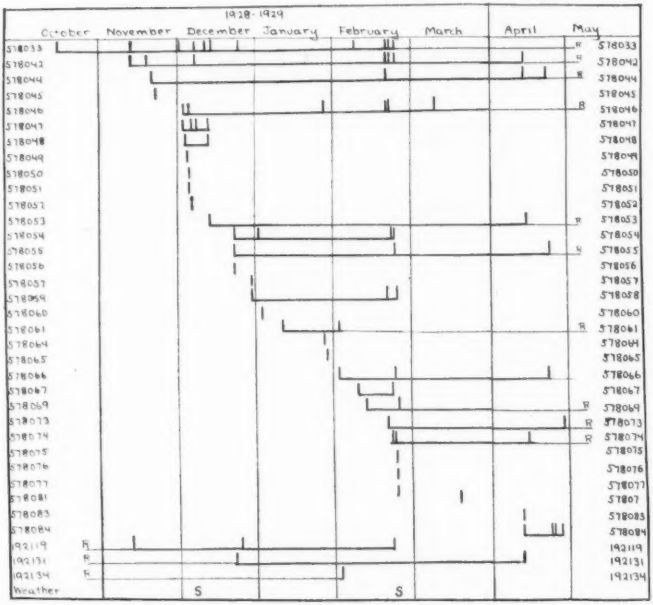


Chart 10. 1928–1929

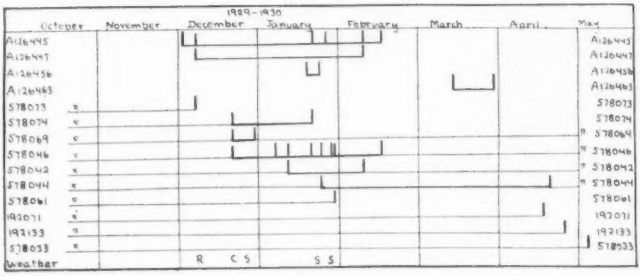


Chart 11. 1929–1930

migrants in December, 1926. 65154, -55, -58, -60 in March, 1923, and 65170, -71, -72, -76 in April, 1923, are two groups of leisurely spring migrants. 120388, -92, -98 wintered through 1923–24, and 120397 and 122931 are both migrating returns in the same winter season. It might seem from a glance at the chart as if these five individuals belonged together, but it must be remembered that up to about the middle of November only wintering and returning individuals are noted on the chart. It happened that on November 10th and 11th, the dates when these five birds were first taken, the fall migration reached its final peak, and many White-throats were taken only once. Each of the groups above indicated may have included other individuals that met with disaster before their movements could again be recorded. This would be particularly true in a group of migrating returns.

Nos. 122975, -76, -77, -78, -80, 61224, and 65170 arrived together in January, 1924, during a cold spell. Two of these repeated (or returned[1]) in April, three returned another year, and two were returns from a previous year. In 1926, 167637, -38, and -40 arrived together; then 167645, -49, -51, and 145068; and later 167654, -56, -57, and 120388 arrived together. The chart (No. 9) for 1927–28 needs no comment in this respect, since the groupings are striking. In early December, 1928, a group appears, another in late December, and one in late February, when inclement weather drove all the wintering birds to the traps. The stragglers of January may be a group that lingered for a short time, or may be members of several groups passing quickly through, whose other members were not trapped.

The chart for 1929–30 shows a rather unusual state of affairs. Of ten wintering birds seven were returns. Three of the ten appeared early in December, three more on December 22d, and four in January. One of the first three did not repeat, but it is well to bear in mind that the final record of a bird may easily be misinterpreted. Possibly this bird met with an accident instead of moving farther south. There is one straggler in March, and three more returns at the time of the spring-migration rush.

Not only do we notice these groups of birds appearing and disappearing at various times during the winter, but sometimes in late February, in March, and in early April, before

[1]These were probably additional examples of migrating returns, but since the absence interval of about three months has been somewhat arbitrarily chosen to determine the status of migrating returns in order to lend greater credence to the theory, these two cannot be so considered in this paper.

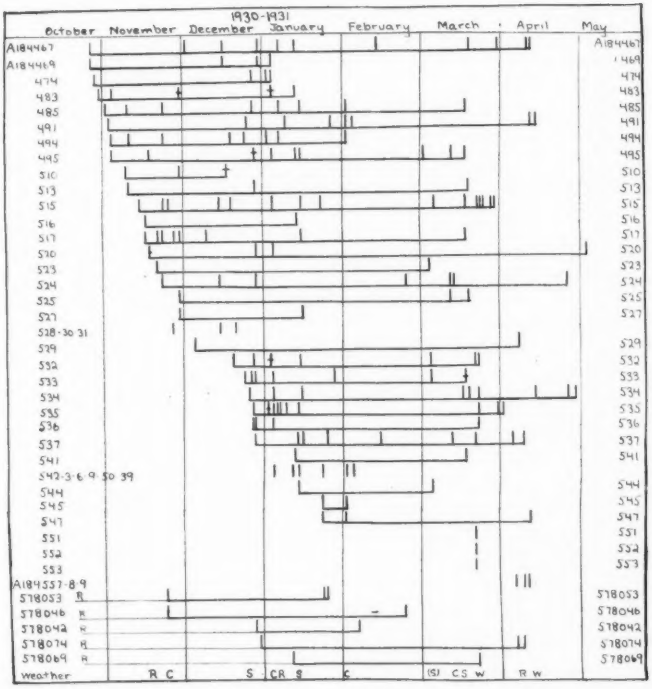


Chart 12. 1930–1931

the main spring-migration, there are indications of group movements. New groups appear, or groups that so far have wintered disappear. Such birds are comparable to the leisurely fall migrants already noted which are not included on the winter charts. The early-spring birds, however, are quite definitely associated in groups. They are mentioned here instead of being included under the heading of Spring Migration because the phenomenon of their appearance is undoubtedly due to the same causes that have created groups throughout the main period of winter.

These group-separations become most noticeable when migration is leisurely or tends to halt during the winter. They are less striking when they occur during the height of the

migration rush, though the two groups of birds already noted, first banded on November 10th and 11th, 1923, have dissociated themselves from the many passing individuals trapped at the same time. There may most likely be similar group-divisions not now discernible within the large aggregations of migration rushes.

We have already noted that of various birds appearing at different times and in various groups during one season some which appear the following winter have rearranged their travelling schedules and have joined new groups. (See Chart 13). It is fairly well established that many species return, so far as possible, to the same locality each breeding-season. Therefore, taking as an example the returns of 1929–30, we may feel sure that, even though ten individuals appear at different times and in different groupings during two seasons, yet they probably all came each fall from a definite breeding-locality. Until these birds are trapped in their breeding-range we cannot know definitely the reasons for the smaller sub-groups, but do they not very definitely suggest family groups which would, of course, vary in personnel from year to year, and which might often, after accident had removed some of their members, be diminished to two or three survivors each? According to Forbush, *Birds of Massachusetts and other New England States*, the White-throated Sparrow has two broods yearly, with four or five young to a brood. This would give an average of nine fledglings to a pair yearly. According to the theory that nature tends to keep the population stationary, there would, in the course of a year's time, be a mortality of nine out of every eleven birds. Thus it will be seen that family groups might easily consist of but two or three birds. Forbush also writes, "When the last brood has been reared, when the August molt is done, the families, which by this time have assembled in straggling flocks, begin to move southward." It is entirely possible that the family group is a more definite entity than the migrating flock.[2]

If this theory of the family group is to hold, it must follow that any given group would originally be composed of one adult male, one adult female, and a number of immature birds. The more we have observed White-throat plumages, the more we feel the difficulty of determining sex superficially, except in the case of very bright males two or more years old, or of very dull, large females. Therefore any conclusions as to sex

[2]See C. L. Whittle "Some Aspects of the Group Habit Among Birds," *The Auk*, Vol. XL., 1923, pp. 224–240.

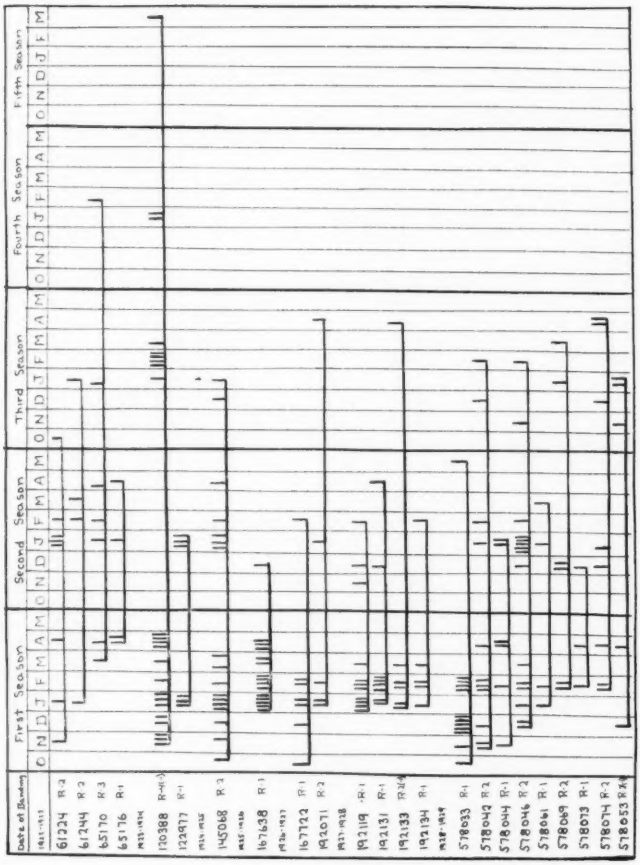


Chart 13. Seasonal Returns.

Short vertical lines indicate each time of trapping. Connecting horizontal lines indicate duration of known history. R with a succeeding digit after the band number indicates the number of returns, viz. — R-3 indicates that the individual was banded in one season and returned during three consecutive seasons.

are, at best, but guesses. The following tables give the serial numbers of certain rather definite groups with the possible sex of each individual.

192133	im. male
192134	ad. male
192137	im. fem.
192138	ad. male
192140	ad. male
122975	ad. fem.
122976	im. ?
122977	ad. fem.
122978	ad. ?
122980	ad. fem.
61224	ad. male
65170	ad. fem.
167637	im. fem.
167638	im. male
167640	im. male
167645	im. fem.
167649	ad. male
167651	ad. fem.
145068	ad. male

192130	im. fem.
192131	im. male
192132	im. fem.
167722	ad. male
192114	ad. male
192115	im. male
192117	im. male
192118	im. fem.
192122	im. fem.
192123	im. male
167654	ad. male
167656	ad. fem.
167657	im. male
120388	ad. male
65170	im. fem.
65171	im. ?
65172	im. ?
65176	ad. ?

A preponderance of adult birds noted, particularly males, stands in the way of the family-group theory. But there is a great deal about migration habits that is not known, and there may be more than one plausible explanation of the abundance of adults. It is conceivable that a lone bird, whose family has all perished, would attach itself, temporarily at least, to a neighboring group. It is known that mortality is highest among immature birds and decreases inversely in proportion to the bird's age.[3]

Attention has already been called to the fact that the winter history of a returning bird varies from year to year. This may be due to some extent to the eccentricities of groups or leaders, and somewhat to weather and other allied causes. An attempt has been made to indicate extremes and severities of weather on the winter charts, but they are only occasional and local. Any study of the effect of atmospheric conditions on bird movements to be adequate must consider the conditions all along the line of possible travel as well as cumulative effects. However, the fact remains, to whatever causes it may be due, that regularity of winter residence such as has

[3]Mr. S. P. Baldwin, in the quotation given above, refers to the White-throats wintering at Thomasville as "a definite neighborhood group."

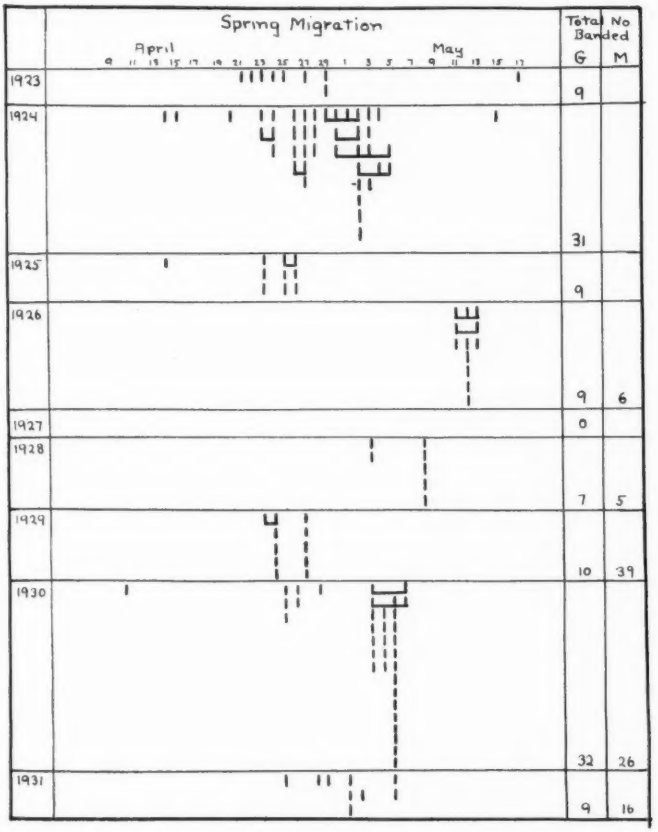


Chart 14. Spring Migration.

Short vertical lines indicate trapping of a bird, connecting horizontal lines indicate repeated trappings for an individual. Since band numbers are omitted, each detached vertical line indicates an individual. Totals for the spring migration season of each year are given under G (Gillespie) and M (Middleton).

been noted at Thomasville does not obtain here. May it not be the case that we are witnessing the slow experimental change of the range of a species? White-throats returning to points much farther south than Glenolden may there locate themselves definitely for each winter, while others of the species that seek winter territories along the northern limits of the winter range may be in the process of extending or curtailing these limits. Thus, influenced by weather, food-supply, or companions, some may spend an entire winter (from October to April) in Glenolden one season, or again may sojourn only for the coldest months another year, or still again may merely pass through with the migration rush for a point farther south.

We may apply this same theory in explanation of group movements during any given winter season, and also in explanation of the lesiurely movements of late fall and early spring. They are all, undoubtedly, various manifestations of the regular phenomenon of variation of winter-range extent. Apart from the regular rushes of fall and spring migration, flexible group movements are occurring throughout the entire time between early fall and late spring. During one season some birds may winter from October to April, and others may appear (usually in definite groups) at subsequent intervals. In some seasons no wintering birds have appeared until January. In general it seems that such leisurely movements, occurring in small groups, depend mainly on the weather. In a mild winter a group may linger farther north than it would during a cold winter, but at any time a spell of severe weather may start it southward. The group of White-throats mentioned by Mr. Middleton as wintering near his station during the mild winter of 1928–29 may be an illustration of this.

At this point I wish to quote Forbush again: "Mrs. Mary E. Hubbard of New Haven, Conn., banded a White-throated Sparrow there in December, 1925, that came to the station again in December and January, and to a near-by station in April, 1926, but the same bird was taken in North Carolina on March 5, 1927, indicating that while it probably spent the winter of 1925–26 in Connecticut, it may have passed the next winter in the South." The facts already mentioned in this paper suggest a further interpretation of this bird's known history. May it not have journeyed south in 1926 between January and April, not necessarily going as far as North Carolina? In southern New England the late fall and early winter of 1925–26 were moderate, with normal precipitation but no snow. In late January and through February there

were a number of snowstorms. In the winter of 1926–27 there was snow in early December ushering in a white winter, and there were marked flights of Snowy Owls and Goshawks. The later winter was mild, but the earlier winter severity would have already driven birds to the south. About Washington, D. C., February and March were reported moderately cool, and if, as is more than likely, the same weather conditions obtained for North Carolina, it is easy to understand why this White-throated Sparrow was taken there in March.

SPRING MIGRATION

The spring migration of White-throats is an elusive and seemingly erratic occurrence from the standpoint of banding data. There are several weeks in the spring when White-throat songs are heard persistently along the Glenolden ravine, and now and then comes a period of two or three days when there are remarkable numbers of White-throats about. At such times the masses of birds are apt to be very local in distribution. In the spring of 1930 they settled down for three days about our house, and were as thickly massed over the lawn and under the shrubbery as a flock of grackles. In the spring of 1931, when migration dates for many species were remarkably late, a large flock settled down in the woods a quarter of a mile northeast on the western slope of the ravine on May 17th, but there was none near the house on that date and consequently none was trapped.

Trapping of White-throats is far less successful in the spring than in the fall. It might seem that there would be a more limited supply of weed seeds in the spring, especially since birds have been feeding on them all winter, but the birds seem to find enough food in the dead leaves underfoot. Perhaps they seek a larger proportion of animal diet at this time when warmer weather favors insect development. It might seem that the greater number of White-throats trapped in the fall could be explained by the inexperience of immature birds, but it happens that a fair proportion of adults are trapped along with the immature birds.

A more plausible reason for the small amount of spring trapping is the general wariness of birds at mating time. It is also true that the total number of spring migrants must be considerably less than the total number of fall migrants, since disasters occur throughout the winter months and the ranks are not replenished by breeding until summer. It would be impossible to say to what extent the reduction of ranks would

reduce trapping possibilities in any given locality, since it cannot be conclusively shown that migration-routes are the same for the two seasons, and particularly since it is strongly indicated that locations and durations of stop-overs vary.

Chart No. 14 shows the total number of birds handled each spring, including all not noted on the winter charts, also the dates on which the birds were trapped. Each short vertical line indicates the trapping of a bird, while a connecting horizontal line indicates repeated trapping for an individual. In order to make the chart more graphic and concise, band-numbers have been omitted, and each detached vertical line represents an individual.

The total number of birds banded during a season is given in a column at the right under G, and by way of comparison Mr. Middleton's totals are given in the column headed M. Mr. Middleton operates his trapping stations just as regularly in the spring as in the fall, yet in 1929, 1930, and 1931, the years when his trapping operations were most extensive, his totals of White-throats have not been appreciably larger than ours in the spring, though far overshadowing ours in the fall.

In 1923, 1924, and 1925 our traps were spread over a considerable extent of the ravine-slope as already explained. But the resulting totals for the spring season are not any greater than those obtained in 1929, 1930, and 1931, when the traps were all near the house. Therefore in spring the banding results are not necessarily indicative of the large migration waves, but only of those groups that settle down for a day or two directly at the trapping station.

SUMMARY

1. Data secured by intermittent trapping give a fair survey of winter residents. A representative survey of fall migrants can be secured only through steady and extensive trapping. Data obtained by trapping are too meager to be representative of spring migrations, or indicative of spring-migration tendencies.

2. The data of fall migration indicate that

a. Weather conditions are undoubtedly a great factor in determining stop-overs and forward movements.

b. There are definite migration-routes but varying stop-overs.

c. The length of time of stop-overs increases as the season advances and as the flocks reach the northern limits of the area of winter territory.

3. The data of the period of winter residence indicate that
   a. Snowfalls and extreme or sudden changes of weather bring to the traps almost all the resident birds as well as new arrivals.
   b. The migration-route is fixed and definite.
   c. There are small group movements in addition to the regular migrations of large flocks, suggestive of family groups.
   d. Habits of groups and individuals vary from year to year.
   e. There is lacking a definiteness of wintering-areas from year to year, and such wintering-areas as are noted (in Glenolden) are not narrowly restricted.
   f. Since wintering-areas seem to be restricted in other regions, differences in restriction may depend on the lay of the land.
   g. Migration movement continues throughout the winter period, even though some groups stay the entire season.
   h. The habits of White-throats during the winter period at Glenolden suggest evidence of a possible extension or curtailment of the northern limits of the winter range.

4. The existence of migrating returns and of leisurely migrants adds credibility to a number of the above suggested theories.

ACKNOWLEDGMENTS

The banding data at Glenolden have been obtained by Mr. John A. Gillespie and the author, working both coöperatively and independently. The author wishes to acknowledge Mr. Gillespie's courtesy in allowing her to make use of the total results, and also his critical reading of the manuscript.

The author wishes to acknowledge the courtesy of Mr. Raymond J. Middleton, both in furnishing her with valuable data from his banding records and also in allowing her to incorporate them in this paper.

The graphical method used has been adapted from the similar method used by Rudyard Boulton and John T. Nichols in "A Method of Analysing Bird-Banding Data," *Bulletin of the Eastern Bird-Banding Association*, No. 2, October, 1925.

AVIAN MORTALITY[1]

By OLIVER L. AUSTIN, M.D.

So few observations and opinions pertinent to the causes of death of birds have been published that some investigations on the subject were undertaken this summer at the Austin Ornithological Research Station. Complete gross autopsies were done on most of the casualties; X-ray films were taken of evident fractures and dislocations; sections for microscopic examination were cut from organs suspected to be diseased, also smears and cultures made for bacteriological study. The data obtained are preserved in the station records and are available to those who desire to peruse them. The following paragraphs epitomize our findings and consequent partially confirmed opinions.

Trauma resulting from their own activities or from violence emanating from other organisms and forces is the outstanding cause of death in birds. Bird movements are so swift that collision with more or less fixed objects determines a destructive force greater than that engendered under similar circumstances by slower moving though heavier organisms. A Maryland Yellow-throat sustained a rupture of the liver with intra-abdominal hemorrhage from flying into a light bird-net. The bird that strikes a telephone-wire while in flight or a lighthouse during the night, or is stopped by an automobile, usually succumbs promptly; dogs and men, while more or less seriously injured by mishaps of equal severity, as a rule survive.

When birds which have died subsequent to the infliction of observed violence or to gross injuries of unknown origin were examined, it was seen, frequently, that the degree of trauma would not have been sufficient to cause death in man. In such instances the presence of concurrent and adjuvanting acute or chronic disease was eliminated by autopsy. Fractures of the humerus or femur and dislocations of the shoulder were found to have been lethal. The lower an organism is in the scale of evolutionary development and the less specialized it is, the less disastrously it reacts to injury. Birds are more highly specialized than is man, their physiological processes proceed at a markedly higher speed, their metabolic rate is far more rapid. Under these conditions, shock with consequent inhibition of vital processes becomes more decisive. A parallel is the collision of a walking man and a speeding automobile with a stone wall.

[1]Contribution Number 2 from the Austin Ornithological Research Station.

Injured birds, as a rule, either succumb promptly or make speedy recoveries. An exception is seen in the case of water-birds, which die slowly of starvation when crippling prevents their obtaining food. Rarely does hand feeding avail with these, although a number of sick shore-birds were reconditioned by feeding with minced clams. Two factors enter into the recoveries—first, the high metabolic rate and high-geared physiological processes which encourage prompt repair; second, the remarkable degree of development of the average bird's adaptability. Sparrows of several species, a Chickadee, and a Red-winged Blackbird found with injuries calling for the amputation of one limb apparently fared as well when released as did their unmaimed relatives. These one-legged birds were prompt in returning to feed in grained traps, while others released with broken wings soon were removed from nets into which they had flown. A Junco, a Song Sparrow, a Chipping Sparrow, and a White-throated Sparrow, each with a fractured radius, made habitats of clumps of bushes close to individual traps. There they lived constantly until recovered. In from three to five days they were able to fly a few feet; after from ten to fourteen days all flew well.

It is thought that confinement in cages with surgical and nursing care did not shorten convalescence, the restlessness consequent to unfamiliar environment and repeated efforts to escape interdicting essential physical rest. On the contrary, healing processes advanced more rapidly without the institution of procedures accepted as distinctly serviceable in the treatment of humans. This was not due to unskillfulness but rather to some instinct which impels birds, unaided, to protect their wounds adequately. Injuries to soft parts do not become infected so commonly as do similar human wounds, although exposure to pathogenic organisms is commensurate for both. It is to be determined whether a bird's ability to produce antibodies is not on a par with its metabolism. Possibly birds have some habit analogous to a dog's insuring drainage and checking infection by frequently licking a wound.

Demonstrated internal injuries were found in an enormous percentage of birds evidencing no external marks of trauma. Such birds have been thought, commonly, to have died of "fright," "senility," or "heart-failure." Fractured ribs with intrathoracic hemorrhage, perforation of the pleural cavity by an impalpably broken coracoid, intra-abdominal bleeding consequent to injuries of the solid viscera, and, most commonly intracranial hemorrhages are adequate pathology for consequent fatalities. Each of these lesions has been found present

in birds dying suddenly and, from a scientific standpoint, otherwise inexplicably.

The common occurrence of head injuries has been little suspected. Greater or lesser hemorrhages, extra and subdural, intracerebellar and intracerebral, also intraspinal, were of overwhelming frequency of occurrence. Excepting in birds found dead or seen to experience great violence, coincident fractures of the cranial bones were exceedingly rare. This has no counterpart in human or other mammalian morbidity. Exceedingly little violence is necessary to the rupture of a blood-vessel. In man the condition known as cerebral concussion implies minute hemorrhages and is consequent to even trivial blows. Cranial injury is, unfortunately, more frequent in birds than in man for obvious reasons. The difficulty of avoiding obstacles during the first moments of flight has been observed. The behavior of birds while in a trap with unheeding efforts to escape is of inevitable consequence. More etiological than all else, however, is the relative thinness of the crania of birds and their greater elasticity, conditions which transmit force sufficient to rupture vessels in underlying tissues without causing concurrent injuries to the bones themselves. In three instances distinct depressions in the cerebra with adjacent hemorrhages were observed with no corresponding fracture of the cranial vault. Given intracranial lesions of the aforedescribed nature with their involvement of vital centers, sudden muscular exertion or a circulatory overstimulation incident to fright or handling is sufficient to cause instant death. The immediate onset of *rigor mortis* often noted is not only the logical outcome of, but also confirmatory evidence of the occurrence and reasonable accountability of, such pathology.

An interesting corollary is the death from insolation of trapped birds which occurred last year during the dog-days, until a determination of this as the cause for these fatalities led to the institution of methods of efficient prophylaxis. Thousands of incubating Common Terns appeared to suffer no great inconvenience from prolonged sitting on sand of which the measured temperature was between 120 and 130 degrees Fahrenheit. Their newly hatched chicks commonly survived identically rigorous exposure. On the other hand, apparently normal sparrows of hardy species succumbed after short confinement in traps where the temperature while high, did not approximate that resisted by the Terns.

The casualties which occurred at the station, while adequate for the acquisition of sufficient data to warrant the concepts

herein expressed, represent but a minute fractional percentage of the twenty-nine thousand times birds were handled this year. Certainly the percentage of violent deaths in both our resident and transitory populations from causes not incident to our trapping is to the left of the decimal point. In any event, if our findings are correct, knowledge of the etiology, as in human affairs, affords the exclusively proper basis for efficient prophylaxis. Thus we shall have been able to accomplish one of the fundamental purposes of our undertaking here—bird conservation.

North Eastham, Cape Cod, Massachusetts.

ON THE STATUS OF JUNCOS IN THE EAST HAVING WHITE WING-BARS

By LEWIS O. SHELLEY

DURING the last thirteen years there has appeared in ornithological literature a number of scattered reports of the occurrence of the White-winged Junco (*aikeni*) in the East, and, as there are several unpublished reports that juncos with white wing-bars have been seen and trapped at banding stations (especially in New England), it seems desirable to publish in a single paper such observations as have been reported in order to furnish a convenient basis for future efforts to determine the status of such abnormally colored birds, that is, whether all or any of the reported occurrences of *aikeni* in the East are valid or are merely those of common Slate-colored Juncos having narrow fringes of white terminating the greater or middle coverts, or both coverts. It is of course well known that such fringes occur occasionally on *hyemalis* and are usually regarded as albinistic in nature and that they also occur more plentifully on *oreganus*.

The literature on the common junco contains numerous references to white on the wings, all agreeing, with the exception of Allen and Brewster, that there is a variation in the whiteness of these wing-markings. Baird, Brewer, and Ridgway[1] write under *aikeni*, "That the white bands on the wings do not constitute a character sufficiently important to be considered of specific value is proved by the fact that in many specimens of *J. oreganus*, and occasionally in *J. hyemalis*, there

[1] *History of North American Birds*, Vol. I, p. 584.

is sometimes quite a distinct tendency to these bands in the form of obscure white tips to the coverts." For those who do not have ready access to literature I will quote a portion of the above authors' description of *aikeni:* "Three instead of two outer tail-feathers entirely white . . . upperparts clear ash; the back with a bluish tinge; the lores, quills, and tail-feathers darker; middle and secondary wing-coverts rather broadly tipped with white, forming two conspicuous bands . . . sides tinged with ash. Three lateral tail-feathers entirely white, the third, however, with a narrow streak of dusky on the terminal third of the outer web, the next feather mostly plumbeous, with the basal fourth of the outer web, and the terminal half of the inner, along the shaft, white."

T. M. Brewer[2] says, quoting Edwin Carter, "that all the adults of this species (*aikeni*), of both sexes, are always found to possess the white wing-bands well defined, and that it is only the birds of the first year, in immature plumage, that furnish what has been mistaken for an intermediate form between this species and the typical *J. hyemalis*." Frank M. Drew[3] writes that *aikeni* is "easily recognized by being heavier-built than their allies, as well as by the white wing-bands, though the latter are variable." Two years later, Allen and Brewster[4] write: "Entire outer webs of first two primaries, and a broad edging of the outer webs of the next three, snowy white to the tips of the feathers. The secondaries and tertials also are broadly tipped with white and the wing bands are exceptionally broad and pure, the general effect of the folded wing being white rather than dark. . . . Among Mr. Aiken's extensive series I found no specimens which showed any intergradation between *J. aikeni* and its allies."

C. W. Beckham[5] writes that the White-winged Junco is "decidedly one of the shyest birds I ever met with . . . otherwise their habits seemed to be similar to those of other Juncos. The skins collected show a great deal of variation in the intensity of the slate color, and in the amount of white on the wings." In the same journal Rockwell and Wetmore[6] have this to say: "Some of the immature females in the present series have merely a trace of the white wing bars, but can be readily distinguished from *hyemalis* by their large size."

[2] *Bulletin Nuttall Ornithological Club*, Vol. III, 1878, p. 75.
[3] *Bulletin Nuttall Ornithological Club*, Vol. VI, 1881, p. 90.
[4] *Bulletin Nuttall Ornithological Club*, Vol. VIII, 1883, p. 190.
[5] *Auk*, Vol. IV, 1887, p. 122.
[6] *Auk*, Vol. XXXI, 1914, p. 325.

A single *aikeni* was taken in 1883 by W. W. Cooke in Jefferson, Wisconsin. See *The Auk*, Vol. II, 1885, p. 33. Jefferson is in southeastern Wisconsin.

There is only one report of the occurrence of this species in the East, that of a bird banded February 28, 1926, published by Mabel Gillespie in *The Auk*.[7] The possibility of *aikeni* having occurred in New England is discussed by Forbush[8] as follows:

"There seems to be no record of the *taking* of this bird in New England. This is a well marked species, readily identified in the field, and there are in letters in the files of the Massachusetts Department of Agriculture several reports of the species which seem credible, but as there is always the possibility of a mistake due to partial albinism, the bird must be relegated to the hypothetical list. We have four 'sight records' of the occurrence of this species in New England. The observers are reliable and had every opportunity to watch the specimens, but it seems best to refuse this species a place in the New England list, until a specimen taken and preserved can be recorded.

"*Vermont:* Waterbury, March 29 and 30, 1919, five or six seen by Dr. G. A. Bidwell. *Massachusetts:* Hatchville, February, 1920, bird observed by Wilfred Wheeler; Falmouth, February 8, 1920, bird seen by Dr. L. C. Jones 'on his doorsteps' (possibly the one seen by Mr. Wheeler); Brookfield, October 19, 1924, one seen by Miss Clara Everett Reed."

More recent reports in letters to the writer are those of a bird with white wing-bars taken by Mrs. Gillespie on March 4, 1930, and one banded by Mrs. Effie A. Anthony, at Great Head, Bar Harbor, Maine, on November 11, 1930. To these records the writer adds two birds trapped and banded on April 5 and 8, 1931, at East Westmoreland, New Hampshire. At that time a small flock of juncos possessing white wing-bars was reported to me as having visited a feeding station in East Westmoreland on two separate days during February, 1931, by one of the local school-teachers, Mrs. Alex Thompson. Regarding them she reported that white wing-bars were distinctly visible, especially when the birds were in flight. While the record in itself is of little value, the report is mentioned because of the fact that later in the spring of the same year several juncos with white wing-bars were trapped at my banding station in the same village.

[7] *Auk*, Vol. XLIII, 1926, p. 245.

[8] *Birds of Massachusetts and Other New England States*, Vol. III, 1929, p. 85.

The literature reveals that *aikeni* is far from abundant even east of Cimarron County, Oklahoma, where the species breed sparingly, but Margaret Morse Nice[9] quotes sight records by T. R. Beard of a flock of 12–20 *aikeni* as far east as Creek County, Oklahoma, between November 10 and January 29, 1920. T. R. Beard[10] also records this species at Sapulpa, Creek County, Oklahoma, in December, 1923.

W. W. Cooke (*The Auk*, Vol. II, 1885, pp. 32 and 33) also reports that in February, 1883, close to his house in Caddo, Bryan County, Indian Territory (Oklahoma), in the southeastern part of the State, he observed one *aikeni*, and shot a second one in worn plumage which was associated with still another in "brighter plumage."

Regarding the recent reports of juncos having white areas in their plumage referred to above, a few of these will be mentioned in more detail.

The bird taken by Mabel Gillespie on March 4, 1930, and presented to the Academy of Natural Sciences, was pronounced an adult male Slate-colored Junco by Wharton Huber, who prepared the specimen. Mrs. Gillespie says that the wing-bars were not so well marked as those of the bird previously banded by her, but, like all of us who have handled white-winged birds, she feels there is more to it than passing it by as an albinistic specimen, and more so since she examined the collection of *aikeni* in the Academy and was struck by the fact of considerable similarity.

The bird banded by Mrs. Effie A. Anthony, at Great Head, Bar Harbor, Maine, did not have pure white wing-bars, these proving to be merely a pale edging to the wings, contrasting with the darker gray, although decidedly conspicuous. It was examined by a bird-student (at Dr. John B. May's suggestion), who measured it very carefully, comparing it with descriptions, and it was decided that it must be an abnormally colored Slate-colored Junco.

At my banding station in the Connecticut River Valley, I banded migrating juncos from two flocks during April, 1931. Thirteen birds from the first flock possessed colorations of which I can find no mention in descriptions by Ridgway, Dwight, and others. Two of these form the basis for the following notes: The buff-yellow color of the under tail-coverts mentioned with these two and present in the rest spoken of above, will not be considered until further data warrant it.

[9] *Birds of Oklahoma*, 1924, p. 85.
[10] *Bird-Lore*, Vol. XXVI, 1924, p. 48.

No other unusual birds were taken, however, after the 8th of the month, soon after which the flock disappeared.

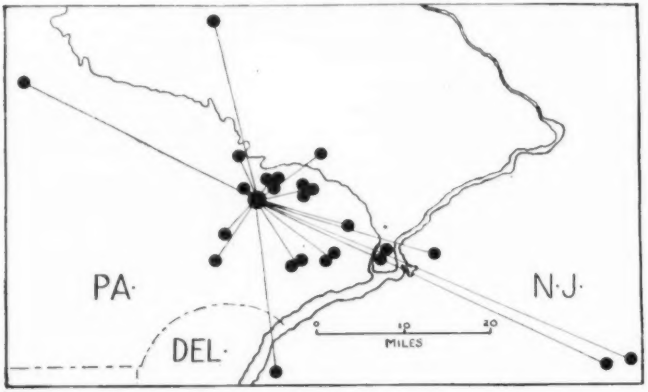
Junco No. C95900, an adult male more than one year old, gave these interesting details: upper parts, sides, and flanks uniformly darker than (most) male *hyemalis*; breast and abdomen uniform pure white, with the under tail-coverts suffused strongly with a color between buff and a warm tan, darkest on the feather-tip margins; tail with three outer feathers white; two distinct white wing-bars on left wing and one on right wing 4 to 5 mm. in width, the bars partly obscured in the folded wing but very prominent in the spread wing; bill pink, black-tipped. Slaty color more overlaid with blackish mantle than in (usual) *hyemalis*. The bird, banded and released, was compared with other birds caught, showing at a glance a noticeably darker cast. Mr. C. L. Whittle tells me he has noted that three- and four-year-old Slate-colored Juncos tend to be darker than younger birds.

A second junco No. C95905, considered a first-winter male, or an unusual female, has upper parts, sides, and flanks of dark slaty, with a tinge of brown, especially noticeable on the inner vane of the tertials; also under tail-coverts buff-yellow. In fact, they appear buff-yellow throughout. Two outer tail-feathers clear white; two pure white wing-bars on each wing 4 mm. wide. This bird gave a call-note which I can reproduce only by the letters *z-z-t*, which I had never heard from a junco.[1] Like C95900, C95905 was a slightly large bird for *hyemalis*, as determined by comparing the bird in hand with a specimen *hyemalis* recently killed and in the flesh.

How many other of the fifty-odd birds in the flock from which the white-winged birds were taken and banded had wing-bars is undetermined, since they left as soon as the inclement weather passed. The buffy under coverts, in both male and female birds, the larger size noted in some handled (greatly prominent in the two mentioned above) while the evidence is very conflicting, give strong points for consideration. Too much stress cannot be placed on the unexcelled opportunity banders possess to gather additional data for determining the status of our (Eastern) juncos having white wing-bars. It is hoped by the writer that the banding of juncos, especially in the East, may materialize into a special study in the hope of bringing to light more and conclusive data on this subject.

East Westmoreland, New Hampshire

[1]The Slate-colored Junco sometimes utters a note that might be so rendered.—F. H. A.



Map 1.
Purple Grackle Recoveries in Pennsylvania and Near-by New Jersey.

RECOVERIES OF PURPLE GRACKLES BANDED AT PAOLI, PENNSYLVANIA, 1923–1931

By Horace D. McCann

Paoli is situated on the south rim of Chester Valley, a broad limestone valley about two miles wide, running from northeast to southwest across Chester County, Pennsylvania. Diagonally across the valley is historic Valley Forge, and beyond in the same direction about ten miles lives my nearest bird-banding neighbor, R. J. Middleton. For a considerable distance to the north and south of the Chester Valley the country is rolling, well-watered with many small streams, and the Purple Grackle (*Quiscalus quiscula*) is generally distributed over this area in the nesting season.

The Grackles generally arrive from their winter quarters during the last week of February, the average date of arrival over a period of thirty-three years being February 27th.[1] In early March their "kerlinking" is a cheerful and outstanding spring note. They soon spread over the country, and nest-building is promptly started. A tall Norway spruce is a favorite location, but as these are scarce, most of the Grackles have to be satisfied with less choice situations. The past

[1] "*The Ornithology of Chester County, Pennsylvania*" by Franklin Lorenzo Burns, 1919, p. 172.

season several nests were made in a row of comparatively young, slender Lombardy poplars.

In 1927 the first adult was banded March 9th, six being banded between that date and April 16th. On May 24th the first immature bird (young of the year) was trapped and the next one on June 11th. On June 27th they began coming to the traps in numbers, and in the last four days of the month fourteen young and one adult were banded. During July ninety-three young were banded; a particularly large group of fifty-four were banded from July 13th to 18th. Further reference to this group will be made below. During August and the first ten days of September nineteen immature and one adult were banded, bringing the season to a close. Of the entire one hundred and thirty-eight banded in 1927, only one repeated, that on the day following the banding.

Of the above group of fifty-four, banded during a period of six days in 1927, it is interesting to note that we had five recoveries the same year, and three in 1928; these appear on the accompanying maps and tabulations. The recovery at Ellerson, Virginia, November 24th, is unusual as all other recoveries from Virginia and North Carolina have been considerably later in the season.

A total of forty-nine were banded during the season of 1928. Only one of the forty-nine repeated, an immature which was trapped on the day following the banding. Recoveries were not so numerous or interesting as those of Grackles banded last year.

In 1929 only one adult was among the sixty-three Purple Grackles banded during the season, and none repeated.

In 1930 fifty-two Grackles were banded, of which five only were adults. This season there were several repeats, the most on record during the eight years of banding. Two repeated once each; one repeated once, five days after banding; and one repeated a single time eight days after banding. These were all juveniles. One, however, had the trap habit, a juvenile, banded July 10th; this bird repeated nineteen times from July 10th to 19th, being taken as often as six times in one day.

Out of three hundred and five banded Grackles, we have had but four returns (See *Bird-Banding* for July, 1931, p. 129). There have been twenty-four near-by recoveries, birds which have been shot or found dead within a dozen miles of our station from one to three years after banding. Several of the recoveries have been Grackles that were shot in the late summer or early autumn of the season in which they were

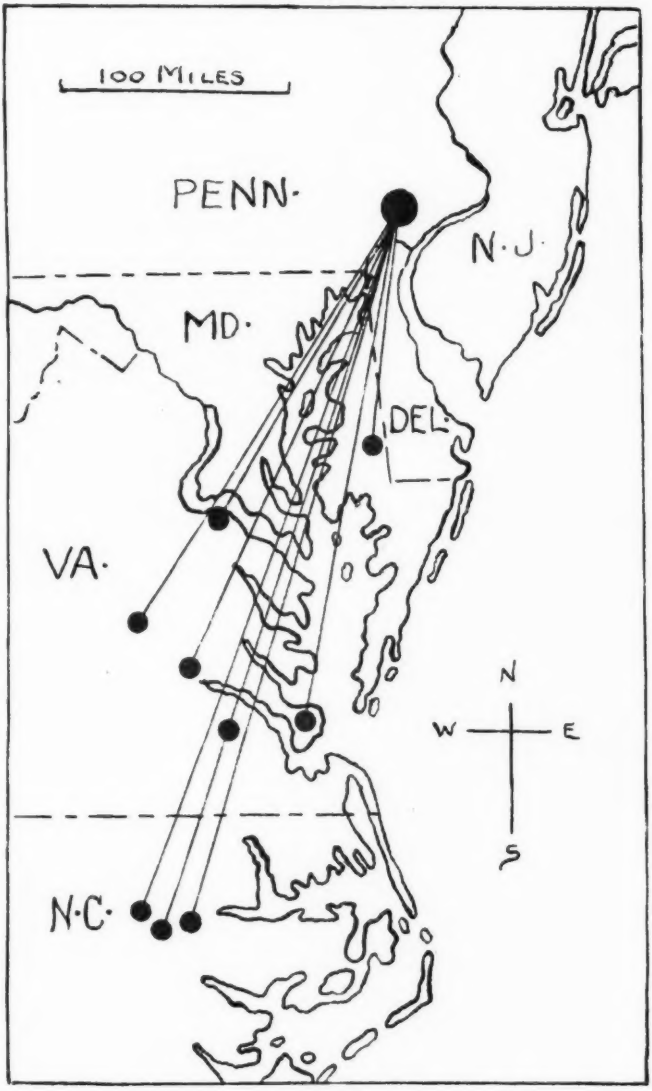
banded. These were all east from Paoli early in the season, and southward later in the season, indicating a drift of the Grackles eastward to the Delaware River Valley near Philadelphia, then turning southward following the course of the river (see Table 1). Eight recoveries have come from an area probably not over one hundred miles across in the southeastern corner of Virginia and northeastern North Carolina, where the birds were apparently wintering. These movements are indicated in the two accompanying tables and maps.

RECOVERIES OF PURPLE GRACKLES NEAR PAOLI
(*Table 1*)

Band Number	*Date Banded*	*Age*	*Recovery Date*	*Place of Recovery*	*Remarks*
274346	Aug. 19, 1923	Ad.	Mar. 31, 1927	Wayne, Pa.	Found dead by F. N. Platt
316365	July 12, 1924	Juv	Aug. 19, 1924	Strafford, Pa.	Shot by unknown
316374	July 18, 1924	Juv.	May 28, 1927	West Chester, Pa.	Found dead by I. McFarland
316385	July 23, 1924	Juv	Aug. – 1927	Adamstown, Pa.	Shot by W. Shabach
316405	Aug. 2, 1924	Juv.	Aug. 15, 1924	Berwyn, Pa.	Shot by unknown
281352	Mar. 18, 1925	Juv.	Apr. 8, 1925	Cedar Hollow, Pa.	Shot by unknown
284502	June 30, 1925	Juv.	Apr 1, 1927	Media, Pa.	Found dead by Wm. L. Rowland
284510	July 6, 1925	Juv.	Aug. 17, 1927	Folsom, Pa.	Shot by unknown
284523	July 11, 1925	Juv.	Oct. – 1925	Berwyn, Pa.	Shot; reported by F. L. Burns
359508	July 21, 1925	Juv.	Mar. 27, 1930	Media, Pa.	Found dead by J. P. Hutchinson
442655	Sept. 6, 1926	Juv.	Aug. 24, 1928	Phoenixville, Pa.	Found dead by Miss A. Cornet
441317	July 5, 1927	Juv.	Aug. 6, 1927	Bridgeport, Pa.	Shot by Felix Piermani
441345	July 13, 1927	Juv.	Oct. 1, 1927	W. Philadelphia, Pa.	Shot by T. Parker
441349	July 14, 1927	Juv.	Dec. 3, 1927	Moore, Pa.	Shot by A. Tilghman
441373	July 16, 1927	Juv.	Oct. 4, 1927	Bechtelsville, Pa.	Shot by Arling S. Fox
441378	July 16, 1927	Juv.	Dec 26, 1927	Hancock's Bridge, N.J.	Shot by Oliver Ayars
441383	July 16, 1927	Juv.	Feb. 1, 1928	Newport, N.J.	Found dead by Addie Lore
441385	July 17, 1927	Juv.	Nov. 5, 1928	Philadelphia, Pa.	Shot by J. Smith
441391	July 18, 1927	Juv.	Nov. 30, 1927	Berwyn, Pa.	Shot by Wm. Doyle, Jr.
525036	Aug. 30, 1927	Juv.	Mar. 13, 1929	Westtown, Pa.	Shot by W. G. Hayward
525064	June 28, 1928	Juv.	July 11, 1929	Strafford, Pa.	Shot by unknown
A342714	July 28, 1929	Juv.	Feb. 7, 1930	Eldora, N. J.	Found dead by K. S. Hand
A342743	Aug. 7, 1929	Juv.	May 17, 1930	Collingswood, N. J.	Found dead in bird-bath by Mrs. B. S. Dorset
A525076	July 6, 1928	Juv.	July 31, 1929	Lansdowne, Pa.	Found dead by Hazel C. Bander

PURPLE GRACKLES RECOVERED IN THE SOUTH
(*Table 2*)

Band Number	*Date Banded*	*Age*	*Recovery Date*	*Place of Recovery*	*Remarks*
316349	July 2, 1924	Im.	Dec. 4, 1924	Charles City, Va.	
293519	July 11, 1924	Ad.	Feb. 13, 1926	Terra Ceia, N.C.	Shot by Delma Fetterton
316381	July 22, 1924	Im.	Feb. 15, 1926	Elberon, Va.	
281390	June 15, 1925	Im.	Mar. 12, 1926	Williamstown, N. C.	Shot by J. L. Swain
284868	Aug. 11, 1925	Im.	Jan. 2, 1926	Hobgood, N. C.	
288849	June 26, 1926	Im.	Jan. 2, 1927	Hampton, Va.	D. L. Miller (presumably shot)
439386	July 10, 1926	Im.	Mar. 30, 1931	Hoocs, King George County, Va.	Captured by S. Jones
442649	Aug. 30, 1926	Im.	Dec. 17, 1928	Preston, Md.	Shot by W. Wheedleton
441390	July 18, 1927	Im.	Nov. 24, 1928	Ellerson, Va	Shot by J. W. Hollins



Map 2.
Purple Grackle Recoveries in the South.

The traps used were of several types, all of which have been described in the "Bird-Bander's Manual" of the Biological Survey: the Government sparrow-trap, Gillespie "round-house" trap, clover-leaf, top-tilting, and Chardonneret traps. By far the greatest number have been taken in the last two traps; the top-tilting trap was placed on a box about three feet above ground level, and the Chardonneret in a small tree about five feet from the ground. The other traps were all on the ground. A few birds were trapped in the Chardonneret trap when placed on the ground. Crumbled bread or soda crackers made satisfactory bait.

SOME NOTES ON THE BREEDING OF THE VESPER SPARROW[1]

By LINCOLN BRYANT, JR.

DURING the summer of 1931, while a member of the staff of the Austin Ornithological Research Station, I gathered some data on the nesting-habits of the Vesper Sparrow, *Poœcetes g. gramineus* (Gmelin). That part of it is presented which permits a comparison of the location and construction of the three nests found, details their histories, and gives the results from banding the only successful brood.

The first nest was found June 26th on a sandy hillside near the station. It was sunk into a depression in the ground about an inch deep under the edge of a tuft of grass, from which its entrance faced northwest. The foundation was of coarse grasses interwoven with rootlets, and the lining was of finer grasses interspersed with a few horsehairs. When discovered it contained two eggs. When visited the next day a third egg had been laid, completing the clutch. Incubation continued until July 2d, when the nest was found torn from its hollow, and its contents missing.

The second nest was found June 30th in a field two hundred yards from the station. Its construction differed from that of the first in that its lining was entirely of horsehair. It measured three inches in diameter, eight inches in circumference, and one inch in depth. It also was sunk into the ground under a sheltering tussock, but differed in that it faced out from the southwest side. When discovered it contained two eggs, and, when revisited on July 3d, it contained three. Subsequently

[1]Contribution Number 3 from the Austin Ornithological Research Station.

it was visited daily. Since a frequently visited nest is very likely to be destroyed by cats, skunks, weasels, or rats, a low wire fence was set up around it the next day. A visit five days later revealed only two eggs, the third having disappeared. Nothing further interrupted the incubation, the two remaining eggs hatching July 14th. The young were short-lived. On July 16th, before they had acquired a complete covering of down, one disappeared, and on the 19th the other was found dead in the bottom of the nest with a wound on its side which appeared to have been made by a sharp tooth or talon. It is impossible to blame any one predator for such systematic and delayed nest-robbing, since the enemies of ground-nesting birds are many. It should be noted that the agency responsible for this destruction overlooked the third nest, which was only sixty yards to the eastward, and which was visited at much more frequent intervals.

The third nest was found on July 15th in a location similar to the second. It was under a tuft of grass in the same open meadow, facing southwest, and contained three eggs. In structure alone did it differ, fine grasses having been used as a lining instead of horsehair. It was the only nest in which the birds were hatched and lived to leave and take care of themselves.

All three nests were built on the ground in open grass-fields, and under grass-tufts. In structure they varied only in lining-material—one was fine grasses, the second fine grasses with a few horsehairs, the third horsehairs entirely. The entrances to all three faced in a westerly direction, one northwest, two southwest. Each nest thus gained full shelter from the easterly and northeasterly winds which bring with them practically all the bad weather encountered here during spring and summer.

Each nest contained three eggs as a full complement. This is considerably at variance from the normal clutch for the species elsewhere, which is given by all authorities as being four eggs as the minimum and six as the maximum. It is possible three eggs comprises the usual clutch for the species on Cape Cod, equally so that the three nests found were all abnormal.

The duration of the incubation period of the Vesper Sparrow is given by F. L. Burns (*Wilson Bulletin*, Vol. 27, No. 1, March 1915, pp. 275–286) as eleven to thirteen days. Individual cases vary greatly, however, since the two factors most influential in determining the length of the period, namely the brooding habits of the parents and weather con-

ditions, are far from constant. The Vesper Sparrow, so far as is known, lays one egg a day until the clutch is completed. Incubation is reckoned usually as commencing the day the last egg has been laid. In nest No. 2 the incubation period began some time between June 30th and July 3d, probably, according to the normal rate of deposition, July 1st. Thus the two eggs hatched in thirteen days. Nest No. 3 was found with three eggs on July 15th, two of which hatched on the 28th and the third on the 29th. Incubation may have begun before the nest was found, but the period was at least fourteen days. Frequent and prolonged absences of the parents from the nest may have extended the duration of incubation.

July 24: "Nest visited four times and no bird found near it; eggs cold to touch. At 10 P.M. parent back on nest."

July 26: "Bird not on nest at all in the afternoon."

July 27: "Vesper off nest all day but on again at night."

As Burns (*idem*) points out, "up to a certain stage of development of the embryo the eggs may be subjected to a cooling process by exposure to the weather for some time without endangering the embryo beyond retarding the growth temporarily and lengthening the incubation period somewhat beyond the normal time."

The possibility of the adult having left the nest without being seen is very slight. Forbush ("Useful Birds and their Protection," 1907, p. 312) states that "when the female is startled from her nest of young, she used all her arts to entice the intruder away, fluttering along the ground with white-bordered tail spread conspicuously, and dragging her wings as if sorely wounded," and there are numerous other references in literature to the same behavior. The birds I observed did otherwise. The parent of nest No. 2 ran quietly through the grass before arising; that of nest No. 3 sat very close until almost stepped on, then flew straight up and away. Although it might appear from many accounts that drawing attention away from its nest by deliberately luring an intruder away is a habit of this species in general, this contradictory evidence shows that the behavior may be merely an individual trait.

The adolescent period is given by Forbush ("Birds of Massachusetts and Other New England States," Vol. 3, 1929, p. 48) as eight to twelve days. During this stage, which lasted ten days in nest No. 3, the young were cared for by both parents. The adults did not become accustomed to the blind used for observation, from thirty to forty minutes elapsing before either of them would return to the nest. Finally one parent waited on a near-by pitch pine watching, while the other stole unob-

trusively through the grass to the nest. They uttered their "chip" note constantly while in the vicinity of the nest, but so far as I could ascertain no sounds were made by the young until after the parents had begun feeding them. Then they uttered the shrill "wheeze" characteristic of a young bird which is being fed.

The plumage of the young birds developed rapidly during adolescence. Seven days after hatching, pin feathers had appeared on the hind head, along the back and wings, and on the sides of the breast. The most advanced feathering, at this time, was on the sides of the breast, but the distinguishing plumage features of the adult bird, the chestnut lesser wing-coverts and white outer tail-feathers, were not yet evident. The day the young left the nest their wings were still poorly developed.

On August 29th, forty-five days after hatching, one of these young birds was compared with an adult that had been banded in 1930. The following differences were noted:—

1. Eye-ring: In adult, very pronounced white. In immature, faint.
2. Head and neck: In adult, brownish with no white tips to feathers. In immature, speckled black and white.
3. Throat: In adult, reddish brown with dull streaks. In immature, with heavy black streaks.
4. Wing-coverts: In adult, tipped with brown. In immature, tipped with white.
5. Chestnut wing-patch: In adult, even color and larger. In immature, diffused with black and smaller.

The disturbance of the nest by my operations may have been the cause of an unnecessarily early departure by the young. I had banded all three of them on August 1st. When a drop trap was erected over the nest to capture the adults on August 7th, I noticed that the young were very restless. In order to accustom the parents to the trap I left the vicinity for about fifteen minutes. When I returned, the trap was found fallen down so that it half covered the nest. The young were gone. The parents were chipping anxiously near by, but no trace was found of their offspring.

Since an attempt to trap the adult at the nest had failed, the identity of the parents remained unknown until the young began to enter the banding traps. Then one adult bird appeared with them repeatedly, having been captured as follows:—

Poœcetes gramineus—No. C83072

Banded	July 12, 1930
Repeated	July 13, 1930
	July 16, 1930

Returned	May 16, 1931	
Repeated	May 10, 1931	
	May 19, 1931	
	June 17, 1931	
	June 18, 1931	
	July 11, 1931	
	Aug. 9, 1931	
	Aug. 18, 1931	with F35683
	Aug. 21, 1931	" F35681
	Aug. 22, 1931	" F35681 and F35683

As the dates show, this adult stopped coming into the traps during the actual nesting-period. The nest was found July 15th and the young left August 7th, whereas this adult did not repeat between July 11th and August 9th. During the period of adolescence of the young the parent would be expected to feed more on insect food than on grain. It is reasonably certain that its appearance with the young in the traps was not coincidence, since the last three times the adult appeared it was with one or two of the young. So it is safe to assume that this bird was one of the parents, probably the female.

The three young birds repeated as follows:—

Poœcetes gramineus—No. F35681—Immature

Banded	Aug. 1, 1931	in nest
Left nest	Aug. 7, 1931	
Repeated	Aug. 21, 1931	with C83072
	Aug. 22, 1931	" C83072 and F35683
	Aug. 24, 1931	
	Aug. 26, 1931	" F35683
	Aug. 26, 1931	
	Aug. 27, 1931	" F35683
	Aug. 27, 1931	" F35683
	Aug. 28, 1931	" F35683
	Aug. 29, 1931	
	Aug. 29, 1931	
	Aug. 30, 1931	
	Aug. 30, 1931	
	Aug. 30, 1931	
	Aug. 31, 1931	
	Aug. 31, 1931	
	Sept. 1, 1931	
	Sept. 5, 1931	
	Sept. 6, 1931	

Poœcetes gramineus—No. F35682—Immature

Banded	Aug. 1, 1931
Left nest	Aug. 7, 1931
Repeated	Aug. 25, 1931
	Aug. 27, 1931
	Aug. 29, 1931
	Aug. 31, 1931
	Aug. 31, 1931
	Sept. 1, 1931
	Sept. 3, 1931
	Sept. 4, 1931
	Sept. 5, 1931
	Sept. 6, 1931
	Sept. 9, 1931

Poaecetes gramineus—No. F35683—Immature

Banded	Aug. 1, 1931	
Left nest	Aug. 7, 1931	
Repeated	Aug. 17, 1931	
	Aug. 18, 1931	with CS3072
	Aug. 19, 1931	
	Aug. 20, 1931	
	Aug. 22, 1931	" F35681 and CS3072
	Aug. 25, 1931	
	Aug. 25, 1931	
	Aug. 26, 1931	" F35681
	Aug. 27, 1931	" F35681
	Aug. 27, 1931	" F35681
	Aug. 28, 1931	
	Aug. 28, 1931	
	Aug. 28, 1931	" F35681
	Aug. 29, 1931	
	Aug. 30, 1931	
	Aug. 30, 1931	
	Aug. 31, 1931	
	Sept. 2, 1931	
	Sept. 2, 1931	
	Sept. 3, 1931	
	Sept. 3, 1931	
	Sept. 3, 1931	
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	Sept. 5, 1931	
	Sept. 5, 1931	
	Sept. 6, 1391	
	Sept. 6, 1931	

It is noteworthy that none of the young entered the traps for ten days after leaving the nest although the adult was taken once in that period. On the tenth day nestling No. 3 appeared alone. The next day it repeated accompanied by the adult. The adult brought in nestling No. 1 for the first time on the fourteenth day. On the following day it entered a trap with both No. 1 and No. 3. These two young birds showed certain definite signs of mutual recognition. They repeated together four more times, last on August 28th. Subsequently both of them were taken separately, No. 1 seven times, No. 3 fourteen times, but never again together. Nestling No. 2 established its independence early. It did not appear in the traps until eighteen days after having left the nest, and although it repeated subsequently eleven times, it never was taken with another Vesper Sparrow. Apparently family ties were not strong after the young left the nest, and all traces of family unity disappeared in three weeks.

The territory occupied by the young to September 10th was surprisingly small. The traps in which they were taken, not one of which was over two hundred and fifty yards from the nest, are those of the regular line nearest it. There are traps

in similar locations at regular intervals for a half-mile in three directions in which they never appeared. This suggests that the wandering of the young may be governed to some extent by the amount of food available. This hypothesis is supported by the behavior of a Vesper Sparrow which, having been banded in 1930 in a nest a mile and half from the trap-line, appeared in the traps two weeks later.

Abundant as the Vesper Sparrow is, apparently an extensive and intensive study of the species has never been made, for the literature on the behavior of young birds and their wanderings after they leave the nest is scarce. Systematic trapping and banding affords the most efficient method of securing data essential to conclusions, having the additional advantage of permitting the study of plumages without the necessity of collecting the birds.

North Eastham, Cape Cod, Massachusetts

GENERAL NOTES

Recovery of a Banded American Eider (*Somateria mollissima dresseri*) —On July 17, 1926, I banded an adult female American Eider Duck No. 301536, on the eastern St. Mary Island, in St. Mary Islands Bird Sanctuary, Saguenay County, Quebec, on the north shore of the Gulf of St. Lawrence. This sanctuary lies in Latitude 50° 18′ N., Longitude 59° 38′ W. The Eider was incubating at the time, and Mr. Fred W. Osborne, the caretaker of the sanctuary, who had visited this nest a few days before and had found this individual bird very tame, succeeded in lifting her from her nest and held her while I banded her.

Through a report which reached Mr. Hoyes Lloyd, of Ottawa, Ontario, while he was travelling in Nova Scotia recently, and which was investigated by him, it has now been ascertained that this bird died near Musquodoboit Harbor, Halifax County, Nova Scotia, in April, 1931. Further details as to its death are uncertain or unknown.—Harrison F. Lewis.

Some Song Sparrow Returns—At my banding station in Chilmark, Massachusetts, I have had the following Song Sparrow returns of interest, returns-1 to returns-4:

Band No	*Banding date*	*Returns-1*	*Returns-2*	*Returns-3*	*Returns-4*
163303	Aug. 13, 1925	Nov. 22, 1926	Nov. 22, 1928	June 4, 1929	Jan. 6, 1930
A34177	Aug. 15, 1925	May 27, 1926	Mar. 29, 1927	Mar. 11, 1928	Mar. 16, 1929
167978	Sept. 19, 1925	July 5, 1927	Feb. 1, 1928		
180763	May 7, 1926	Feb. 22, 1927	Jan. 20, 1930		
180733	Feb. 27, 1926	April 4, 1927	Jan. 28, 1928	Jan. 15, 1929	
180773	June 26, 1926	April 4, 1927	Jan. 15, 1929		
194868	Oct. 18, 1926	July 11, 1927	Mar. 18, 1928		
194898	May 9, 1927	Feb. 1, 1928	Mar. 31, 1929	Mar. 6, 1930	
511438	July 16, 1927	April 10, 1928	April 11, 1929		
A71847	Aug. 18, 1927	April 14, 1928	April 4, 1929		
511439	July 18, 1927	April 28, 1928	May 9, 1929		
511458	July 22, 1927	May 8, 1928	April 27, 1929		
194884	May 23, 1927	April 12, 1928	April 27, 1929		
574177	July 20, 1928	July 2, 1929	July 12, 1931		
A136609	July 18, 1929	May 13, 1930	May 3, 1931		

—George D. Eustis, Hollyholm, Chilmark, Massachusetts.

A Common Tern Recovery—According to advices just received from the Bureau of Biological Survey, a clipping from *Chasseur Français* reports that a Common Tern wearing band number A380069 was killed by Professor Poncy, of Geneva, Switzerland, at Cayenne, French Guiana, March 28, 1931. This band-number was one of two hundred and seventy-two placed on young Common Terns by Warren F. Eaton and B. S. Bowdish at Bird Island, Brant Beach, New Jersey, July 13, 1930.—B. S. Bowdish.

A Second Red-Winged Blackbird Return-S—A Red-winged Blackbird return-S was taken by George D. Eustis at Chilmark, May 23, 1931, which he banded July 1, 1930. Only one other return Red-wing has been taken in Massachusetts as far as I know, one banded by Laurence B. Fletcher at Cohasset, May 3, 1925, and retaken by him May 7, 1926. We have a Red-wing return-W on our records, a bird banded by William P. Wharton at Summerville, South Carolina, May 18, 1929, and retaken May 8, 1930.—C. L. Whittle.

A Towhee Recovery—Towhee (*Pipilo erythrophthalmus erythrophthalmus*) A270281, male, banded January 14, 1931, at Summerville, South Carolina, was killed by a cat at Palmer, Massachusetts, on May 8, 1931. This is the first recovery of a Towhee banded by me.—William P. Wharton.

A Six-Year Old "Sight"-Return Rose-breasted Grosbeak—On June 5, 1926, band No. 117477, coated with yellow pyralin enamel, was placed on the left tarsus of a young male Rose-breasted Grosbeak, at my station in Peterboro, New Hampshire. This bird, at the time of banding, had brownish wings and tail, and was judged to be only one year old. This year, on June 1, 1931, a male Grosbeak feeding at my station was observed to be wearing a yellow band. As my records indicated a band placed five years earlier, the bird was trapped before it left the station, and the band was carefully examined. The pyralin coating was found to be practically perfect, after five years of more or less constant abrasion—a remarkable record for the durability of this material. This was our first return record for this bird, now at least six years old.

Incidentally, the unworn condition of the band might lead us to suppose that this particular male Grosbeak had not habitually assisted in incubation and the brooding of the young. We find, among the Purple Finches, that during incubation and the rearing of the young, the bands of the females become brilliantly polished, while the bands of the males remain unpolished. In the case of the Grosbeaks, the females cease visiting the station when active nest duties begin, and we have no record of finding their bands polished, but we assume that their bands are worn down in the nest, in a manner similar to the bands of the Purple Finches.—Helen Granger Whittle.

A Cape Cod White-throated Sparrow Recovered in South Carolina—A migrating White-throated Sparrow, B112685, banded by Dr. Oliver L. Austin at North Eastham, Massachusetts, on October 2, 1930, was caught by a cat at Ravenels, South Carolina, during February, 1931, the location of this recovery being about ten miles from Summerville. The information and the band were brought to me by the Sheriff of the County, to whom they had been turned over by the finder.—William P. Wharton.

East-West and West-East Purple Finch Recoveries—There seem to be on record only three recoveries of this sort:

An adult female, banded by M. J. Magee, at Sault Ste. Marie, Michigan, on May 8, 1923, was killed by a cat at Tatemagouche, Nova Scotia, on June 17, 1929.

A54292, banded by C. L. Whittle, at Cohasset, Massachusetts, on January 30, 1927, was recovered by Dr. K. Christofferson, at Pickford, Michigan, (a few miles south of Sault Ste. Marie), on March 10, 1929.

C69545, banded as young of the year, by Magee, at Sault Ste. Marie, Michigan, on August 17, 1930, was recovered by R. M. Hinchman, at Milton, Massachusetts, (a few miles north of Cohasset), on February 14, 1931.

The first bird might have gone south and there joined a flock going northeast. The same is true of the second, only in the opposite direction. It seems rather improbable that the third could have done likewise and got to Milton, Massachusetts, in the time elapsed. So we may assume a fairly direct west-east trip. But, as the records of over 11,000 birds, banded by Magee, show nothing further to support this, we must regard it as one of those purely fortuitous exceptions which are said to prove the rule.—Richard M. Hinchman, Milton, Mass.

New Returning Species—Species taken as true returns-W at Summerville, South Carolina, for the first time during the season of 1931 were Vesper Sparrow, Song Sparrow, Catbird, Junco, Myrtle Warbler, and Ruby-crowned Kinglet. Three individuals of the first-named species, all banded in the winter and spring of 1930, were trapped in the same general localities where they were banded. The same is true of the two Song Sparrows. But one individual of each of the other species named was recovered, each likewise banded during the season of 1930, and all taken at approximately the same localities where they were banded.—William P. Wharton.

A Slate-colored Junco Recovery—A Slate-colored Junco, female, No. C95899, banded by me at East Westmoreland, New Hampshire, April 5, 1931, was found dead by Luke B. Amos at Doaktown, New Brunswick, April 24, 1931. It was trapped from a flock of fifty or more individuals, the last bird from which was taken on April 8th, immediately after which date I believe they resumed the northern migration, for none appeared at the traps for an interval of five days. At this slow rate of migrating, it seems notable that the bird in question covered the distance to New Brunswick in a fifteen-day period at the most. This bird when banded was manifestly either leaving its winter quarters or migrating to its nesting-grounds. In either case the record shows a marked northeast migration direction.—Lewis O. Shelley, East Westmoreland, N. H.

Some Notes on Starlings—At this station during a period of two years ending this April, we have banded one hundred and eleven Starlings, of which one hundred were caught in an ordinary drop-trap and eleven were banded as fledglings in nesting-boxes.

Of the entire one hundred adults banded only one repeated, and this bird repeated once on the day following its banding. Of the eleven fledglings, one individual, No. A153805, banded in a nesting-box half a mile north of our station on June 19, 1929, was trapped at our station on November 15th of the same year, showing little movement from its birthplace if it was present in this territory during the entire five months. Adult Starling No. A273689, banded February 26, 1931, at our station, was reported to the Bureau of Biological Survey as found dead on April 9th by the nine-

year-old son of Mrs. M. Kuehne, living about three fourths of a mile south of our station. This record also shows little spring movement.

Starlings at our station seem very trap-shy, and while groups of twenty-five to fifty were often feeding within twenty-five feet of our house, no birds were observed with bands. These birds are very greedy, and the best bait is table scraps and suet. They feed close together, but not without fighting. As many as five have been caught under a four-foot drop-trap at once during periods when snow is on the ground.

In a letter from the Biological Survey dated March 25, 1931, it is stated that 18,421 Starlings have been banded, and while the new return file has not been completed, 352 returns have been recorded, consisting of 125 from localities other than where they were banded, and 227 trapped or otherwise captured at the banding locality.

In case of many of the Starlings trapped at this station, notes were made on the coloring of the mandibles, and a great variety of shadings were recorded. On this matter, W. C. Henderson, Acting Chief of the Biological Survey writes:

"Mr. E. R. Kalmbach, of this office, who has made quite an extensive study of this species, states that there is a distinct sexual difference in the coloring of the bill. The male bird has a deep, almost chrome yellow tip to its bill, whereas the base of the lower mandible is of a lead-blue color. The tip of the female's bill is of a paler yellow, and the base of the lower mandible is pale, almost white. This brightening of the bill takes place far in advance of the breeding-season. Mr. Kalmbach further states that he has seen individual birds that had brilliantly colored bills as early as the middle of November. Immediately after the breeding-season, the bill darkens, losing all of its yellow hue. He has no information concerning the factor of age in connection with this coloration, although he is inclined to believe that the more mature birds have the most brilliantly colored bills."

In *Farmers' Bulletin* 1571 of the Department of Agriculture, Mr. Kalmbach in writing of the bills of this species gives much the same description but adds that while the brightening of the bill may occur as early as the middle of November, normally it is not apparent until January or February. In checking over my own notes I find No. A249142, trapped February 6, 1931, as having upper mandible all black; lower, black, shading to grayish at base. No A249146, trapped on February 16, 1931, the same as A249142; while A249147, caught with A249146, had a brilliant chrome-yellow bill. Could it be possible that Starlings having a very dark bill late in February are young birds of the previous summer? It is probable that age is a deciding factor in the coloration of the mandibles of these birds, as Mr. Kalmbach is inclined to believe. Unfortunately no notes were taken of the fledgling that was retrapped.—GEOFFREY GILL, Huntington, Long Island, New York.

Rose-breasted Grosbeak Returns—It is always an impressive experience to have birds return which have wintered hundreds and perhaps thousands of miles beyond our borders and have made migration journeys of two to three thousand miles during their seasonal absence. It is even more impressive if, as shown by recent records, at least 66.66 per cent of locally nesting adults are able to make these journeys in safety, presumably across the hazardous Caribbean Sea or the Gulf of Mexico.

During 1930 six nesting adult Rose-breasted Grosbeaks (*Hedymeles ludoviciana*)—three males and three females—and three young-of-the-year were banded at my station in Peterboro, New Hampshire. Of these, two adult males and two adult females and one young-of-the-year returned and nested in 1931.

In 1930 three pairs came to my station nearly every day during the nesting-season. This season (1931) I have also, as stated, three pairs of nesting Grosbeaks, five of them being banded birds of 1930. It was not possible to determine the actual pairs mated in 1930, but opportunity certainly existed for remating in 1931.

The first male to appear at my station in 1931 came on May 10th, a female appearing the following day. It is probable that the sexes migrated north together.—CHARLES L. WHITTLE, Peterboro, New Hampshire.

Trapping Birds with Nesting-Materials—The use of nesting-materials in traps was tried for the first time this season at the Clary banding station, with some success in the case of kingbirds, orioles, and Mockingbirds. The materials used were string, cotton, and hemp-rope ravelings.

Arkansas Kingbirds (*Tyrannus verticalis*) have nested for several years on the cross-arm of a transformer pole thirty feet west of our house. Practically all the material used in their nests the past two years has been supplied by Mr. Clary and myself. By watching the type of material being selected by the birds we have been able to supply all their needs, such as heavy string for anchoring the nest to the pole, and later cotton for lining and sides. When dried grasses were being hunted, we cut rope into convenient lengths and unravelled it. All of this material was placed in sight of the nest and under favorite perches used by the birds. A characteristic habit of these birds is to alight on a wire or post above the desired object, study it for a few minutes, and then sweep down taking it on the wing.

When one kingbird's nest was well along toward completion and the birds were accustomed to look to us for material, we began placing it nearer the house where we intended placing the trap. Let me say here that only the female, as we later learned, worked on this nest. As soon as she began coming fearlessly to the wires of the pergola two feet from the door, we wired the gathering-cage to a post, placed a tuft of cotton inside, and awaited developments. At first she tried hovering over and under the trap in an attempt to pull the cotton through the narrow mesh of the wire. We then nailed a piece of lath for a perch in front of the drop door and in a short time had her banded. The male was not seen until a week after the nest was completed. Three babies were banded from this nest, and the second day after they were out of the nest the mother was busy repairing it for a second brood.

With only one of the pair banded it has been easy to follow the activities of this royal family. Almost all feeding and care of the young has fallen upon the busy mother, the father's sole contribution to family life being that of an admirable watch dog and defender. We saw only two attempts by him to feed the young, but these were met with such a drubbing on the part of the female that he retired, nor did he offer to help in the repair of the nest for the second brood, as we had hoped. Additional material was supplied and taken for the second nest, but as the banded partner alone was concerned, we made no attempt to trap her again.

Noting female Bullock Orioles (*Icterus bullocki*) unraveling a tarpaulin covering on an outdoor bed, we placed a trap over the ravelled part and added a generous supply of cotton and string fastened so as to wave in the breeze. In a few minutes a Mockingbird was trapped. Every approach of the Oriole thereafter resulted in a declaration of war by the Mockers; so we placed the trap in a different location and the same afternoon had trapped and banded a female Oriole.

Nesting-material as well as wheat was placed in the trap that caught our first Crissal and Le Conte Thrashers this spring. What part the

nesting-material played in attracting these birds we cannot say, but we are inclined to believe that they entered for food.

Although our success with this method of trapping has not been as great as we had hoped for, we have found that it added a new interest to banding during this dullest part of the banding year, as well as adding to our list of banded birds the elusive adult Arkansas Kingbird.—MARJORIE D. CLARY, Coral Reef Ranch, Coachella, California.

NOTE.—A letter from Mrs. Clary, dated September 1, 1931, states that during the nesting-season of 1931 several more Kingbirds and Bullock Orioles were trapped by using nesting-materials.—EDITOR.

A Chipping Sparrow Recovery—Chipping Sparrow C50172, banded March 23, 1930, and taken by me at Summerville, South Carolina, as a return on March 9, 1931, was "found" at Zebulon, North Carolina, on May 11, 1931. Zebulon is about two hundred miles in an air line from Summerville. It is impossible to say whether this bird was migrating or preparing to nest in the locality at the time of its recovery.—WILLIAM P. WHARTON.

A Correction—In the July, 1931, number of "Bird Banding" I notice that the page-headings of my article place Summerville in North instead of South Carolina. The main heading at the beginning of the article is given correctly, but it is possible that the page-heading titles might mislead some readers. Will you therefore kindly publish this correction in the next number.—WILLIAM P. WHARTON.

RECENT LITERATURE

Der Vogelzug, Vol. 2, No. 3, July, 1931.

This number opens with a paper by Thienemann and Schüz on new return records of banded Hooded Crows (*Corvus c. cornix*). Detailed compilations are given for birds banded as migrants in the Rossitten region. Data are given for thirty-four individuals arranged according to the areas in which they were recaptured. Thirteen were retaken fairly close to Rossitten; seven were recaptured in the region from East Prussia to Holland; two in Latvia; four in Estonia; one in Russia; seven in Finland; and one on Öland Island.[1]

The authors also report the results of experiments on Hooded Crows in which they used artists' green paint instead of bands as a method of marking. The results are not as satisfactory as banding, but because of the visibility of the paint, permitting identification in the field, the method is considered worthy of further technical improvement.

Return records of Hooded Crows banded as nestlings the previous year show that the birds tend to return to their birthplace or vicinity the following year.

Geyr von Scheweppenburg writes on flight against strong contrary winds and observes that certain small birds, especially finches, frequently move against contrary winds, even against head-on storms. They not only do not avoid or flee from such atmospheric disturbances, but even seem to choose a course of flight directly into them, perhaps to make the most of them.

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[1]There are two islands called "Öland," one is in Sweden, and one in Schleswig, Holstein. The former is the one here intended.

Drost contributes further data on the direction of the wind with relation to the flight of finches and concludes that though at times the birds seem to avoid head winds, they much more frequently fly into them. He gives some interesting figures from his own observations. Chaffinches (*Fringilla coelebs*) flew with a following wind in twelve per cent of the cases; with a lateral following wind in six per cent; against a direct head wind in twenty-three per cent; against a lateral contrary wind in fifty-nine per cent. The Linnet (*Carduelis cannabina*) was never seen to fly with a direct following wind, and in only five per cent of the cases with a lateral following wind. In twenty-five per cent of the cases it flew directly against the wind, and in seventy per cent against a partly contrary wind.

Salomonsen contributes an article on the Willow Warbler (*Phylloscopus trochilus*) at Helgoland, based on forty-six birds found dead at the base of the Helgoland lighthouse. He finds that three races are represented, *eversmanni* and *acredula* of northern Europe and *fitis* of central Europe. The typical form, that of the British Islands, is not represented. (However many writers do not consider *fitis* and *acredula* distinct from typical *trochilus*).

Rüppell raises the question as to whether the young of the White Stork (*Ciconia c. ciconia*) migrate without guidance from the adults. He finds that the young birds leave the breeding-area from two to fourteen (usually four or five) days before the adults, which suggests that they travel without guidance. However, more data are needed to answer the questions that arise from the original one, and the author requests that additional observations be sent to the station at Rossitten.

Drost continues his notes on the characters by which to tell the sex and age of migrant birds (the first paper appeared in Vol. I, No. 4, of *Der Vogelzug*). He discusses the Greenfinch (*Chloris chloris*), the Chaffinch (*Fringilla coelebs*), the Brambling (*Fringilla montifringilla*), and the six species of thrushes of the genus *Turdus* that occur in Germany.

Schüz gives a compilation of return records of birds banded in Asiatic and European stations other than the Helgoland and Rossitten ones.

Among the shorter notes are some of general interest. Schuster reports a common Buzzard (*Buteo buteo*) returning to the same winter area. Three interesting records of banded Red-backed Shrikes (*Lanius collurio*) are as follows: a bird banded in Slovakia, retaken in Greece; another, banded in Germany, recaptured in Darfur, Sudan; the third, marked in Germany, retaken in Asia Minor. Ponbsek and Von Transehe record banded Starlings recaptured long distances from the place of banding—records of interest in connection with the discussion of the migratory habit of this bird in America. A White Stork, banded in Germany, recaptured in India, is reported by Drost.—H. F.

Pateff on birds banded in northern Europe, recovered in Bulgaria.[1]

Pateff records thirty-three birds banded in places as distant as Helgoland and Denmark on the west, and Russia, Finland, and the Caspian Sea on the east, subsequently recaptured in Bulgaria. The thirty-three birds belong to twelve species. The White Stork (*Ciconia ciconia*) is represented by no less than fifteen individuals banded in Hungary, Germany, and Denmark; the Black-headed Gull (*Larus ridibundus*), comes next with six examples banded in Germany, Hungary, Russia and Esthonia. Three Pintails banded in Russia were recaptured in Bulgaria, as well as single specimens of such interesting forms as the Hoopoe, two sea Eagles, the Squacco Heron, the Spoonbill, and the Lapwing. A map showing the localities at which the birds were banded and those at which they were retaken illustrates the extensive wanderings involved.—H. F.

[1]Pawel Pateff; *Bull. des Institutions Roy. d'Hist. Nat.*, Sophia, Bulgaria. Vol. 4, 1931, pp. 115–120.

Vogelring (a mimeographed journal, now in its 3d year).
Organ der "Zweigberingungstelle," Marburg, Hesse-Nasseu; der "Vogelwarte Helgoland"; und des "Vogelring, Vereinigung für Vogelkunde und Vogelschutz," Marburg. Edited by Dr. Werner Sunkel, Otto Balzerstrasse 10, Bad Ems, Germany.

This journal contains a number of papers, but unfortunately it is so poorly mimeographed and so crude in its general appearance, that is is difficult to take it very seriously. American bird-banders may feel fairly certain that most of the important notes of German workers find publication in "Der Vogelzug". The present number (the only one seen by the reviewer) contains the following articles:

Work in Limited Areas, by Werner Sunkel
The Trap with the Decoy, by Werner Sunkel
Bird-Trapping Experiences in Spring of 1931 at Wetzlar, by Fritz Freita
Statistics on Swallow-Banding at Dillich, by A. Boley
Plans for Bird-Banding on a Large Scale, by W. Sunkel
Banding Woodpeckers, by Hartmann.
Bird Migration in Borod, by Henrich
Compilation of Data on Swallow Banding in Niederbiel, by W. Dietz
The Nest of the Dipper, by J. Hoffmann
The Cuckoo Living in the Hedge: A "poem"(?), by A. Straub
On the Migration of the Cuckoo, by W. Sunkel
My Owl, by E. Dreisbach—H. F.

British Birds. Vol. XXIV, No. 10, March, 1931. A. W. Boyd and E. P. Leach report finding bird bands in pellets and about the nests of various hawks and owls, the bands representing a total of twelve species of birds. One Hedge Sparrow band was found five years after the placing of the band. This brings to mind Stoddard's report of the examination of pellets from a Marsh Hawk roost on a Quail preserve in Georgia, when two pellets showed leg-bones with bands attached, though only two others of the 1095 pellets held Quail remains.—J. B. M.

British Birds. Vol. XXIV, No. 11, April, 1931. A. W. Boyd contributes an interesting article on the results of banding Greenfinches. Between 1909 and 1930, 8814 birds of this species were ringed, with 190 recoveries, or 2.2 per cent. Tables show recoveries of birds banded as nestlings and of adults in winter and in summer, while maps give the distribution of the recoveries of young and of adult birds. Mr. Boyd draws the conclusion that the Greenfinch is a largely sedentary species, with a slight tendency to move south in winter. The oldest bird recovered was at least five and a half years of age.—J. B. M.

British Birds. Vol. XXIV, No. 12, May, 1931. The editor, Mr. Witherby, contributes five pages of records of birds banded abroad and recovered in the British Isles. Among the most interesting are a Black-headed Gull banded in West Jylland (Jutland) in 1920 and recovered in Essex in 1929; and Common Gulls banded near Copenhagen in 1922 and 1925, recovered in 1929.—J. B. M.

British Birds. Vol. XXV, Nos. 2–3, July and August, 1931. Mr. Witherby gives extended reports of recoveries of birds ringed in the British Isles. Some of the oldest birds recovered were a Lapwing, banded in June, 1921, recovered in February, 1928; a Woodcock, May, 1925, to

November, 1930; Common Tern, July, 1921, to April, 1931; Common Tern, June, 1924, to June, 1931; Sandwich Tern, June 12, 1917, in Cumberland, recovered in southwestern Africa February 23, 1931, (seven other recoveries of this species from Natal, Portuguese West Africa, and French West Africa are also noted); Starling, March, 1924, to November, 1930; Song Thrush, September, 1926, to January, 1931. A Robin ringed in November, 1922, repeated twelve times to February, 1928; another ringed in 1925 repeated ten times to October, 1928; and a third, ringed in 1925, five times to January, 1931. Of especial interest to Americans was a Kittiwake ringed in the Farne Islands, Northumberland, June 23, 1928, and taken near Terenceville, Newfoundland, December 10, 1930.—J. B. M.

Canadian Field-Naturalist. Vol. XLV, No. 2, February, 1931. This issue contains more of the official Canadian records of banding returns. As in previous reports, a very large proportion are of ducks and geese, with a goodly number of gulls and but few of the smaller land-birds. Possibly this indicates a need for more intensive trapping of adult birds at banding stations in Canada. Among interesting recoveries are a California Gull banded in Alberta in June, 1922, recovered in Saskatchewan in September, 1929; a Gannet banded at Bonaventure Island, Quebec, in September, 1923, taken at Cape Breton six years later; a Black Duck banded at Lake Scugog, Ontario, in 1923, taken on Georgian Bay, Ontario, in 1929; another banded at Lake Scugog in 1924, killed on Cape Cod in 1929; a Crow banded in Saskatchewan in July, 1924, retaken a few miles from the point of banding in July, 1929. A Robin banded at Barkerville, British Columbia, in April, 1926, was recovered at Slaton, Texas, in February, 1929, while a Chimney Swift banded near Milton Junction, Wisconsin, in May, 1927, was recovered in Cobourg, Ontario, in September, 1929—J. B. M.

Canadian Field-Naturalist. Vol. XLV, No. 6, September, 1931. Additional official Canadian banding records include a Pintail banded in Iowa, March 10, 1923, recovered in Saskatchewan exactly seven years later, to a day; a Herring Gull banded at Bonaventure Island in July, 1924, recovered on Cape Cod in February, 1930; a Purple Finch banded at Sault Ste. Marie, Michigan, May 8, 1923, taken in Nova Scotia in June, 1929; another banded in New Haven, Connecticut, in January, 1928, recovered in Alberta in May, 1929; a Bronzed Grackle banded in Saskatchewan in 1926, taken in Louisiana three years later; and a Starling banded in Washington, D. C., in January, 1928, retaken in Ontario, March 24, 1930. A Chimney Swift banded at Thomasville, Georgia, in October, 1928, was taken the following July at Athabasca, Quebec, while another Swift, banded near Kingston, Ontario, on September 2, 1928, was taken again at Charleston, West Virginia, twelve days later, and again retaken at Kingston about four and a half miles from the original place of capture on May 10, 1929.—J. B. M.

BIRD-BANDING

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